BX-820W

Fan-less Embedded System

User's Manual

Version 1.0a

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How to Use This Manual

The manual describes how to configure your BX-820W system to meet various operating requirements. It is divided into four chapters, with each chapter addressing a basic concept and operation of Fan-less Embedded System.

Chapter 1: System Overview. Present what you have in the box and give you an overview of the product specifications and basic system architecture for this fan-less embedded system.

Chapter 2: System Installation. Show the definitions and locations of all the interfaces and describe a proper installation guide so that you can easily configure your system.

Chapter 3: BIOS Setup Information. Specify the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 4: Important Instructions. Indicate some instructions which must be carefully followed when the fan-less embedded system is used.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

We, announced BX-820W, a high performance fan-less embedded system. Powered by the 4th generation Intel® Core™ processor (formerly codenamed Haswell) with integrated HD4600 graphics engine, the BX-820W system supports high-resolution triple-display output, serving as an ideal platform for performance and graphics-demanding applications.

Our BX-820W is designed to be power-optimized and value-optimized. Instead of adopting a mobile CPU like a traditional embedded system, BX-820W utilizes a 35W Intel® desktop CPU and Intel® Q87chipset, which is more economical compared to its mobile counterpart and provides great efficacy as well as low power consumption; this makes BX-820W not only competitive but outstanding in the market . The system further takes advantage of the Intel® Core™ processor technologies supporting dual channel DDR3 memory up to 16GB. Furthermore, the BX-820W Box PC includes rich I/O interfaces and fast connectivity with: three independent display (Display Port/HDMI/VGA) interfaces, two Gigabit Ethernet ports, two RS-232/422/485 ports, four RS-232 ports, four USB 2.0 and four USB 3.0 ports, one 8 bits GPIO port, and Mic-in/Line-in/Line-out. An optional wireless or 3G module can be added via a mini PCIe slot.

In addition, the embedded board that drives the BX-820W system features an innovative PCI/PCIe expansion module. Via a unique gold finger design, users can easily maintain or replace the PCI/PCIe module. Moreover, thanks to the isolated chamber that accommodates an add-on card separately, the system's thermal design is optimized to further maintain operation stability. Additional thermal solutions, such as a customized heat spreader, can be implemented to realize a truly rugged fan-less system with diversified add-on cards. Expansion interfaces include 2 x PCIe or 1 x PCI and 1 x PCIe by request.

The rugged, fan-less design makes the BX-820W durable in harsh environment applications, such as factory automation and industrial automation. Our BX-820W has already passed a vibration test of 5Grms/ 5~500Hz and a shock test of 50G, assuring its solidity and reliability. In addition, the system accepts a wide input voltage range from 12V to 36V. This power-source flexibility enables product usage in a variety of situations. Moreover, the BX-820W is more than a robust and dependable Box PC system with high performance and graphics efficacy. Its stylish mechanical design enhances the system's artistry. Potential applications include POS, kiosk and intelligent digital security and surveillance, etc.

1.2 Check List

The BX-820W package should cover the following basic items:

- ✓ One BX-820W Fan-less Embedded System
- ✓ One 120W AC/DC Power Adapter DC-plug with screw
- ✓ Two Keys for lockable HDD/SSD tray
- ✓ One Wall Mount Kit
- ✓ Other Accessories

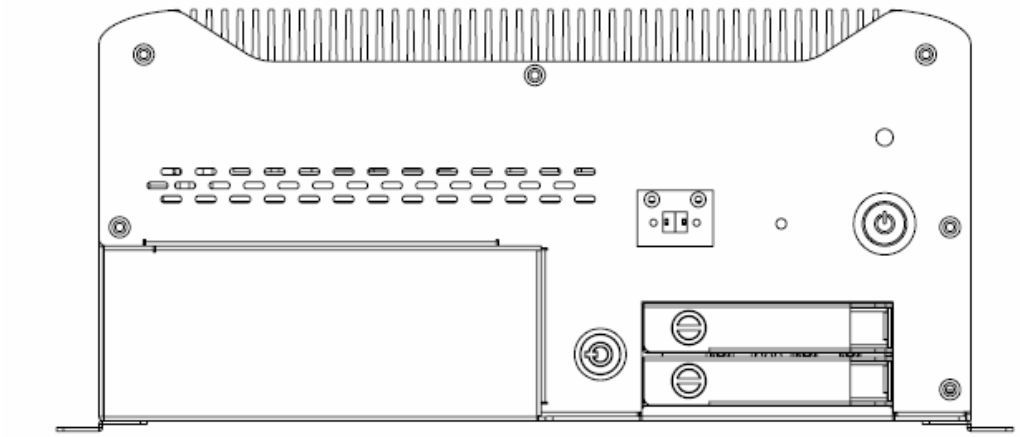
If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

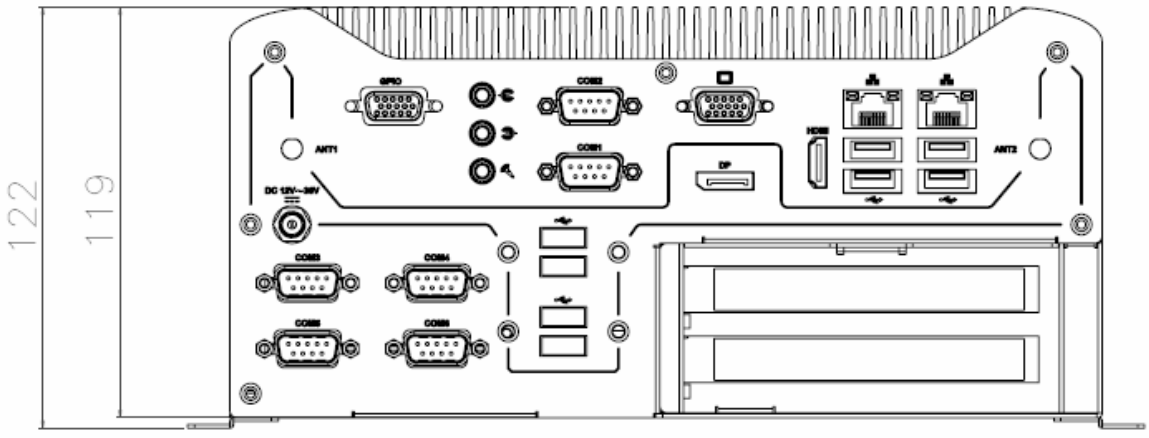
System	
System Chipset	Intel® Q87 chipset
CPU	Intel® Core™ i3-4330TE Processor. 2.40Ghz/2C/4T/DDR3 CPU.4M Cache. Intel® Core™ i5-4570TE Processor. 2.70Ghz/2C/4T/DDR3 CPU.8M Cache. Intel® Core™ i7-4770TE Processor. 2.30Ghz/4C/8T/DDR3 CPU.8M Cache. Intel® Celeron® G1820TE Processor. 2.20Ghz/2C/2T/DDR3 CPU.2M Cache. Intel® Pentium® G3320TE Processor. 2.30Ghz/2C/2T/DDR3 CPU.3M Cache.
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	Dual 240-pin Long-DIMM sockets support DDR3 1333/1600 up to 16GB
Storage	2x 2.5" SATA HDD/SSD, 1x SATA DOM
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	-Temperature (CPU & System) -Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	-1x Full-size Mini-PCIe socket -2x PCIe x4 slot or 1x PCI & 1x PCIe x4 slot
External I/O	
Series Ports	6x COM Ports (2x RS-232/422/485 selectable by BIOS & 4x RS-232)
Display	1x VGA, 1x DP, 1x HDMI
USB	4x USB 3.0, 4x USB 2.0
Audio	Lin-in/Lin-out/Mic-in (ALC886)
LAN	2x Gigabit Ethernet (Intel® WGI217LM + WGI210AT)
GPIO	1x Programmable 8-bit digital I/O
Other	-2x Antenna holes for WIFI or 3G/GPS module -1x EXT Power switch

Power Supply Unit	
Power Supply	DC 12~36V
Environment	
Operating Temperature	-20℃ to 50℃ with Turbo boost Disabled in BIOS (Default) -20℃ to 40℃ with Turbo boost Enabled in BIOS
Storage Temperature	-40℃ to 80℃
Relative Humidity	95% @ 40℃, non-condensing
Operating Vibration	5Grms/5~500Hz, IEC 60068-2-64
Operating Shock	50G, 11 msec, IEC 60068-2-27
Mechanical	
Dimension (WxDxH)	253 x 193 x 120 mm; 10" x 7.6" x 4"
Weight	7 kg
Mounting	Wall Mount

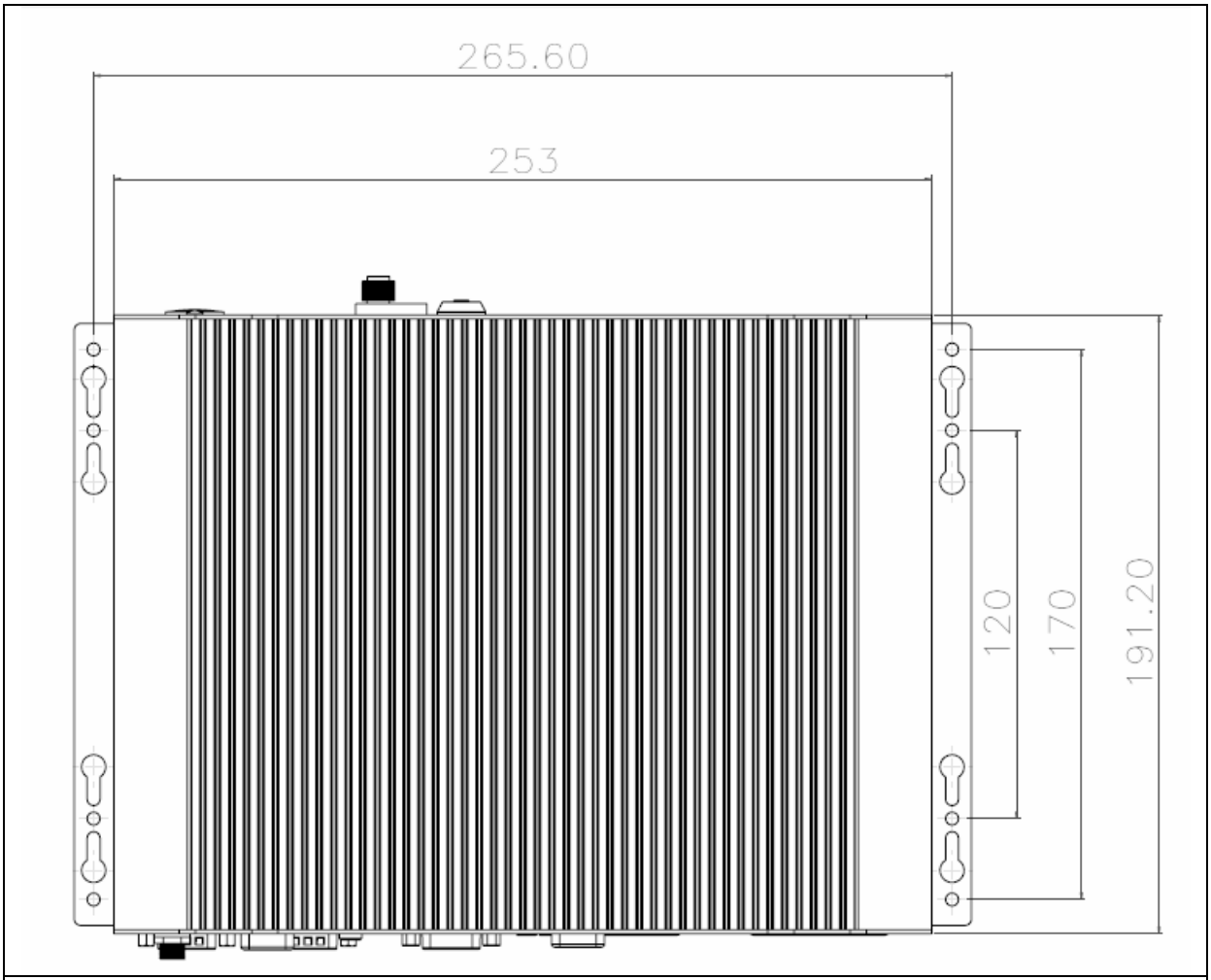
1.4 Mechanical Dimension



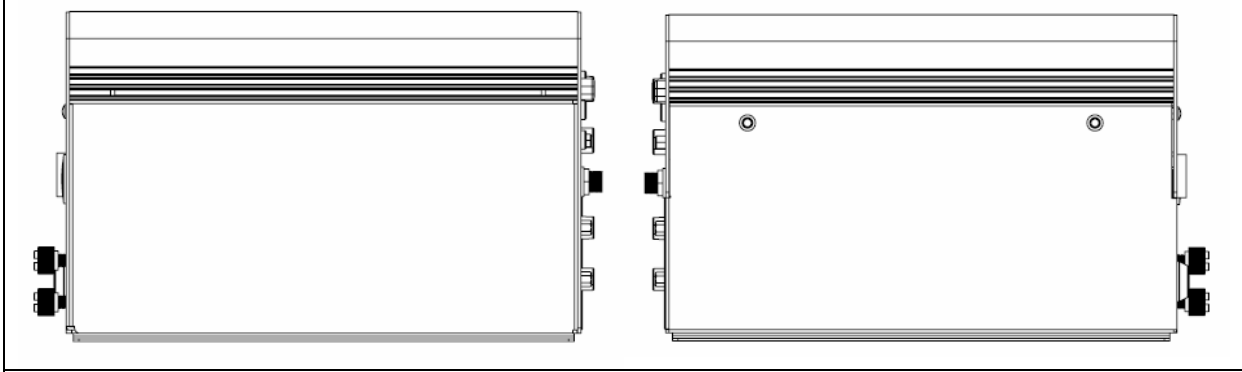
Front view of the BX-820W system



Rear view of the BX-820W system



Top view of the BX-820W system



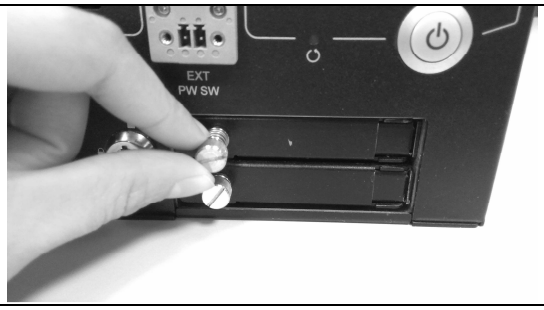
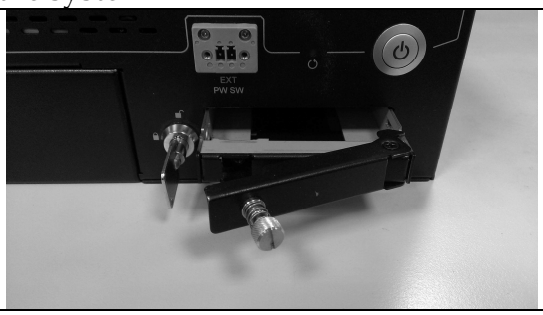
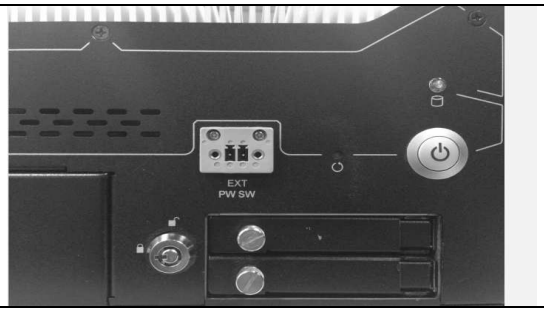
Side view of the BX-820W system

Chapter 2
System Installation

This chapter provides you with instructions to set up your system. Definitions and locations of all the interfaces are described so that you can easily configure your system.

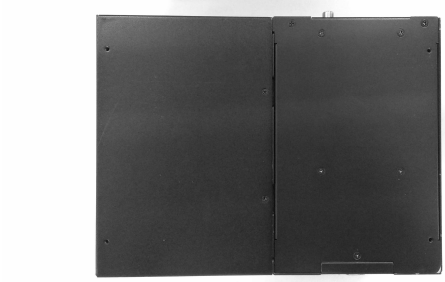
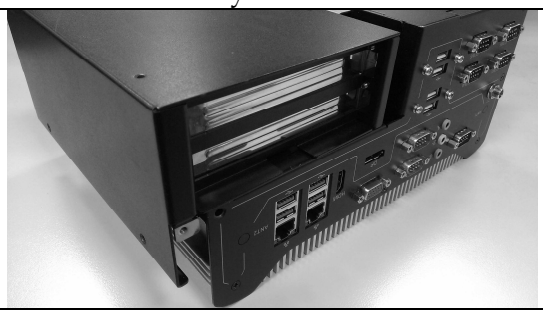
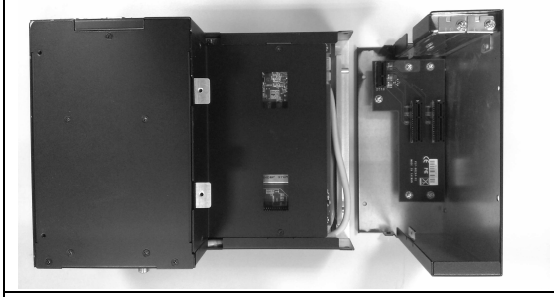
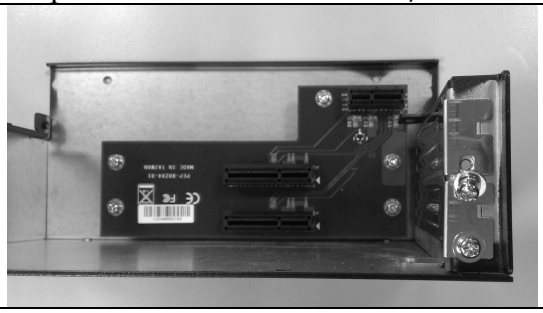
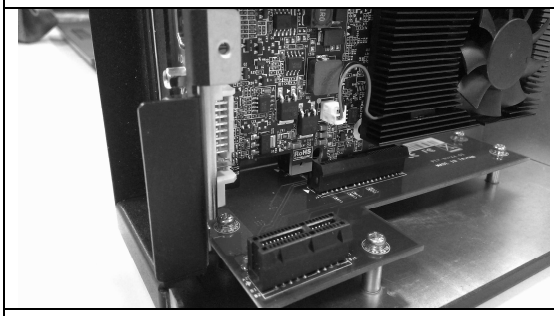
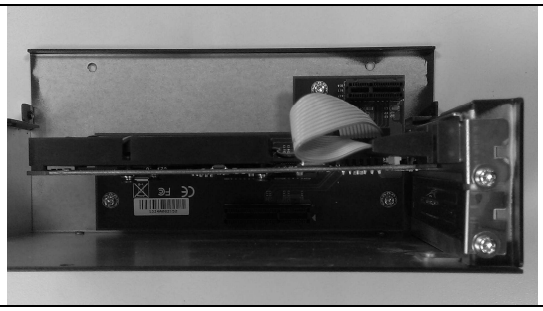
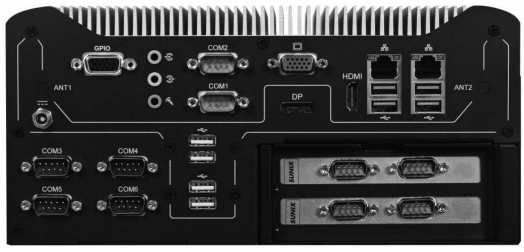
2.1 HDD Installation

Unique design of the HDD tray allows easy installation and maintenance of 2.5" HDD/SSD. RAID function is supported with dual HDD/SSD design. (The height must be less than 10mm)
*Note: Key should be plugged in when user draw out/pushes back the HDD tray.

Step 1. Turn the key to unlock the HDD tray	Step 2. Loosen the thumbscrews of the HDD cover
	
Step 3. Draw out the HDD tray from the system	Step 4. Install the HDD into tray with screws
	
Step 5. Push the HDD tray back	Step 6. Tighten the thumbscrews and finish installation
	

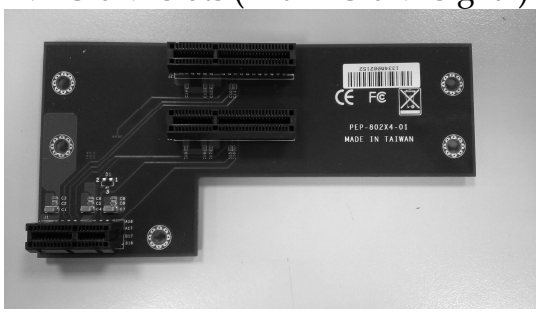
2.2 PCIe/PCI Card Installation

Equipped with an innovative PCI/PCIe expansion module, user can easily install and replace their own expansion cards.

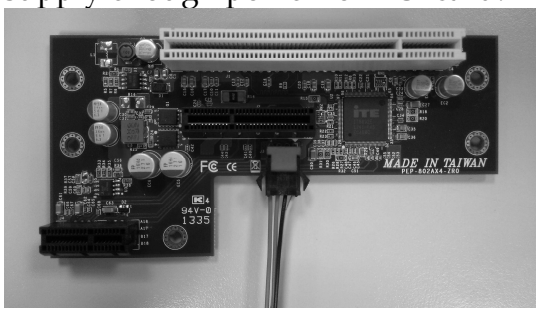
Step 1. Loosen the screws of the expansion module (there are 6 screws)	Step 2. Carefully detach the module from the main system
	
Step 3. Take out the expansion module	Step 4. Loosen the screw of I/O cover
	
Step 5. Install the expansion card via the PCIe x4 slot	Step 6. Screw the expansion card
	
Step 7. Install the module back to the system and screw it	Step 8. Finish the installation
	

There are two types of riser cards:

- 2x PCIe x4 slots (with PCIe x1 signal)

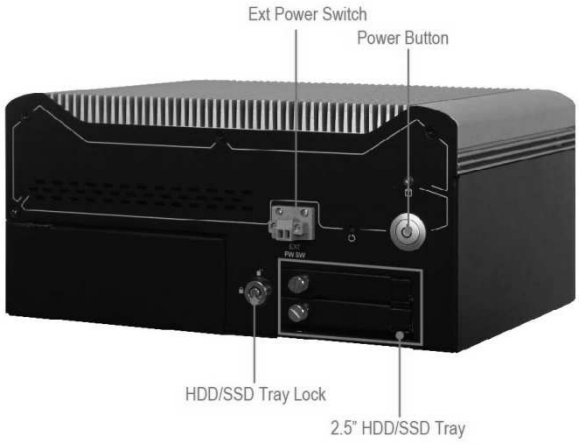


- 1x PCI slot & 1x PCIe x4 slot (with PCIe x1 signal)
  *Note: Power cable between main system and the riser card is needed to supply enough power for PCI card.



2.3 I/O Interfaces

2.3.1 Front View



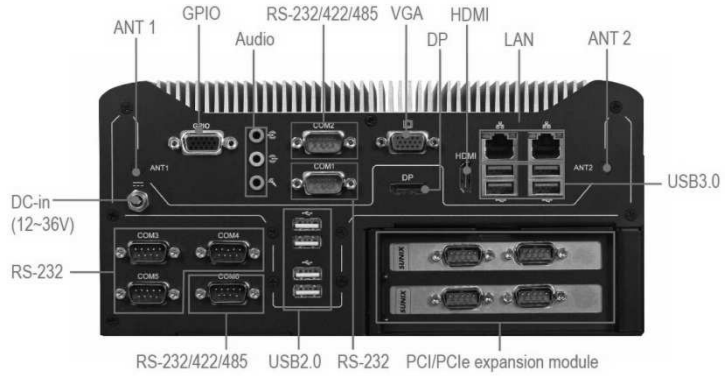
Ext Power Switch:
It is for remote system ON/OFF control

Power Button:
Press the power button to turn ON/OFF the system

HDD/SSD Tray lock:
Key lock for removable HDD/SSD tray lock or unlock

2.5" HDD/SSD Tray:
Two removable 2.5" HDD/SSD trays for storage installation

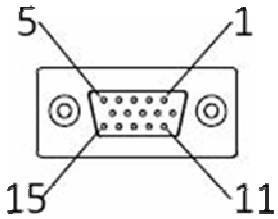
2.3.2 Rear View



DC in: (Wide range DC source support, 12 ~36V)
Using the provided DC source to connect to the system

ANT1 & ANT2 hole:
Antenna holes for WiFi or 3G/GPS module

GPIO:



Pin	Signal	Pin	Signal	Pin	Signal
1	GPIO0	6	GPIO5	11	N/A
2	GPIO1	7	GPIO6	12	N/A
3	GPIO2	8	GPIO7	13	N/A
4	GPIO3	9	GND	14	N/A
5	GPIO4	10	+5V	15	N/A

Audio:
Connectors for Mic-In, Line-In and Line-Out

LAN:
Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports by using Intel WGI217LM & WGI210AT GbE Ethernet Controller

USB3.0 & USB 2.0:
Support eight USB (Universal Serial Bus) ports, four USB 3.0 and four USB 2.0.

VGA:

VGA – CRT display output

PIN No.	Signal Description	PIN No.	Signal Description
1	Red	2	Green
3	Blue	4	NC
5	GND	6	RGND
7	GGND	8	BGND
9	KEY(+5V)	10	SGND
11	NC	12	SDA
13	H Sync	14	V Sync
15	SCL	16	

DP:

DP (DisplayPort) display output

PIN No.	Signal Description	PIN No.	Signal Description
1	D0+	2	GND
3	D0-	4	D1+
5	GND	6	D1-
7	D2+	8	GND
9	D2-	10	D3+
11	GND	12	D3-
13	AUX_EN#	14	GND
15	AUX+	16	GND
17	AUX-	18	Hot plug
19	GND	20	VCC3

HDMI:

Type A HDMI display output

PIN No.	Signal Description	PIN No.	Signal Description
1	D0+	2	GND
3	D0-	4	D1+
5	GND	6	D1-
7	D2+	8	GND
9	D2-	10	D3+
11	GND	12	D3-
13	NC	14	NC
15	DDCCLK	16	DDCDATA
17	GND	18	VCC5
19	HPD		

PCI/PCIe expansion module:

Equip with a PCI/PCIe riser card for PCI/PCIe HBA adapter expansion.

- Default: Two PCIe x4 slots (PCIe x1 signal).
- Option: One PCIe x 4 slot (PCIe x1 signal) and one PCI slot

COM port:

- RS-232

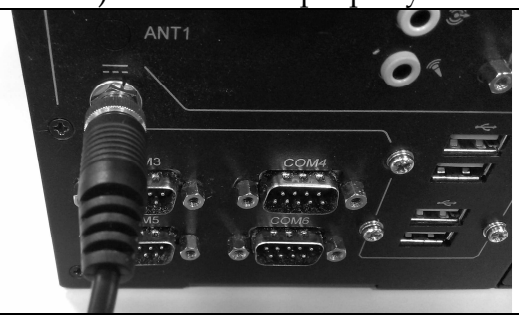
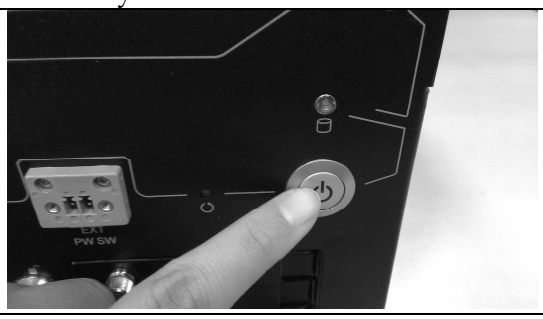
Pin	Signal
1	DCD#
2	RXD#
3	TXD#
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

- RS-232/4222/485
  *Note: RS-232/422/485 configuration is determined by BIOS setting. Check BIOS setting for details.

Pin	Signal
1	DCD#/DT-
2	RXD#/DT+
3	TXD#/422R+
4	DTR#/422R-
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

2.4 Getting Started

It is easy to get the system started.

Step 1. Make sure the power supply (12~36V) is connected properly	Step 2. Press the power button to turn on the system
	

Chapter 3
BIOS Setup Information

Mother board for BX-820W is equipped with the Phoenix BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, mother board communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

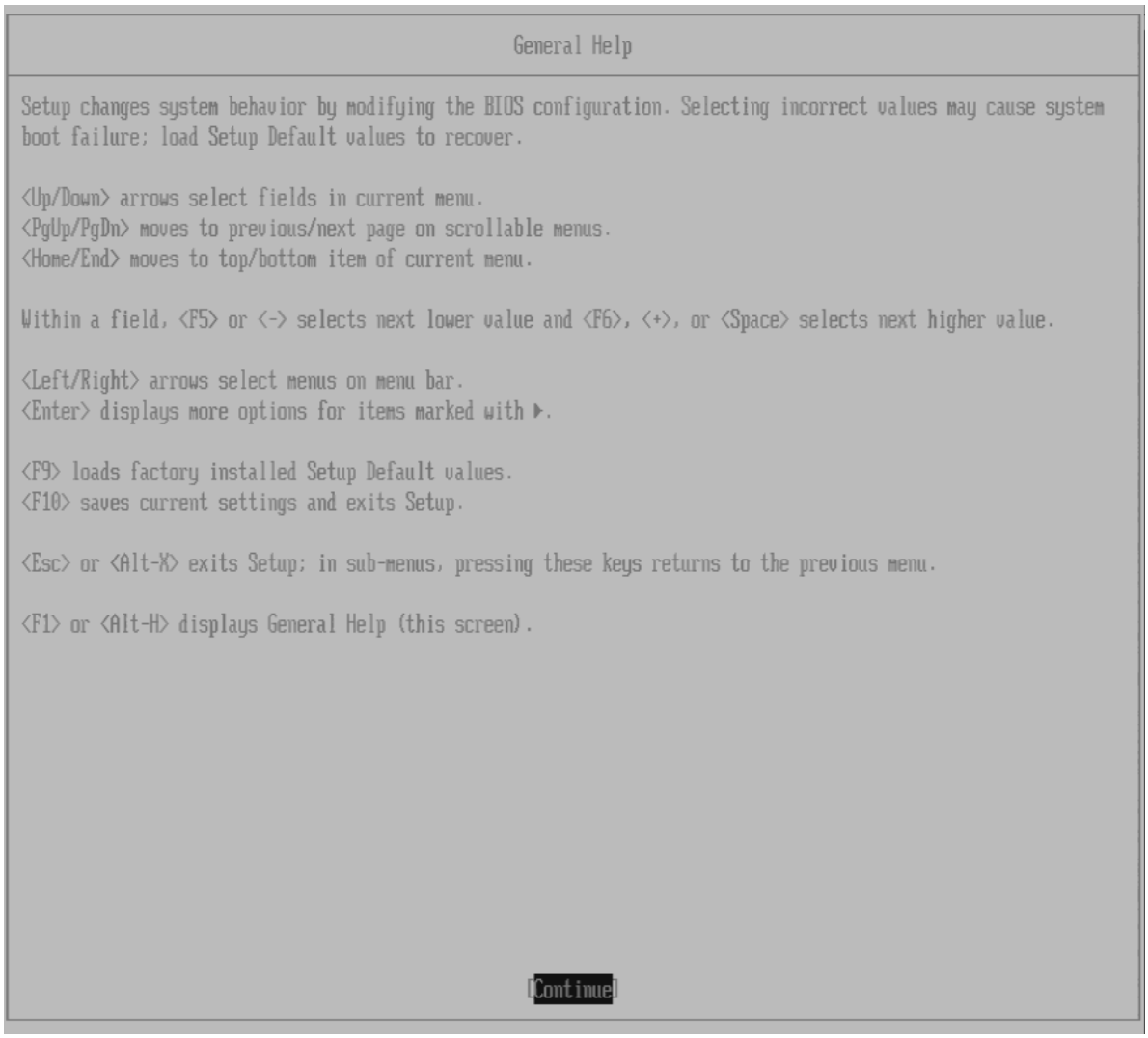
3.1 Entering Setup

Turn on or reboot the computer. When the message “Hit <F2> if you want to run SETUP” appears, press <F2> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try “COLD START” again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from “WARM START” by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F2> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.


General Help
Setup changes system behavior by modifying the BIOS configuration. Selecting incorrect values may cause system boot failure; load Setup Default values to recover.
<Up/Down> arrows select fields in current menu.
<PgUp/PgDn> moves to previous/next page on scrollable menus.
<Home/End> moves to top/bottom item of current menu.
Within a field, <F5> or <-> selects next lower value and <F6>, <+>, or <Space> selects next higher value.
<Left/Right> arrows select menus on menu bar.
<Enter> displays more options for items marked with ▶.
<F9> loads factory installed Setup Default values.
<F10> saves current settings and exits Setup.
<Esc> or <Alt-X> exits Setup; in sub-menus, pressing these keys returns to the previous menu.
<F1> or <Alt-H> displays General Help (this screen).
[Continue]

3.2 Main

Once you enter its Phoenix BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.
This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.
Follow command keys in CMOS Setup table to change Date, Time, Drive type, and Boot Sector Virus Protection Status.

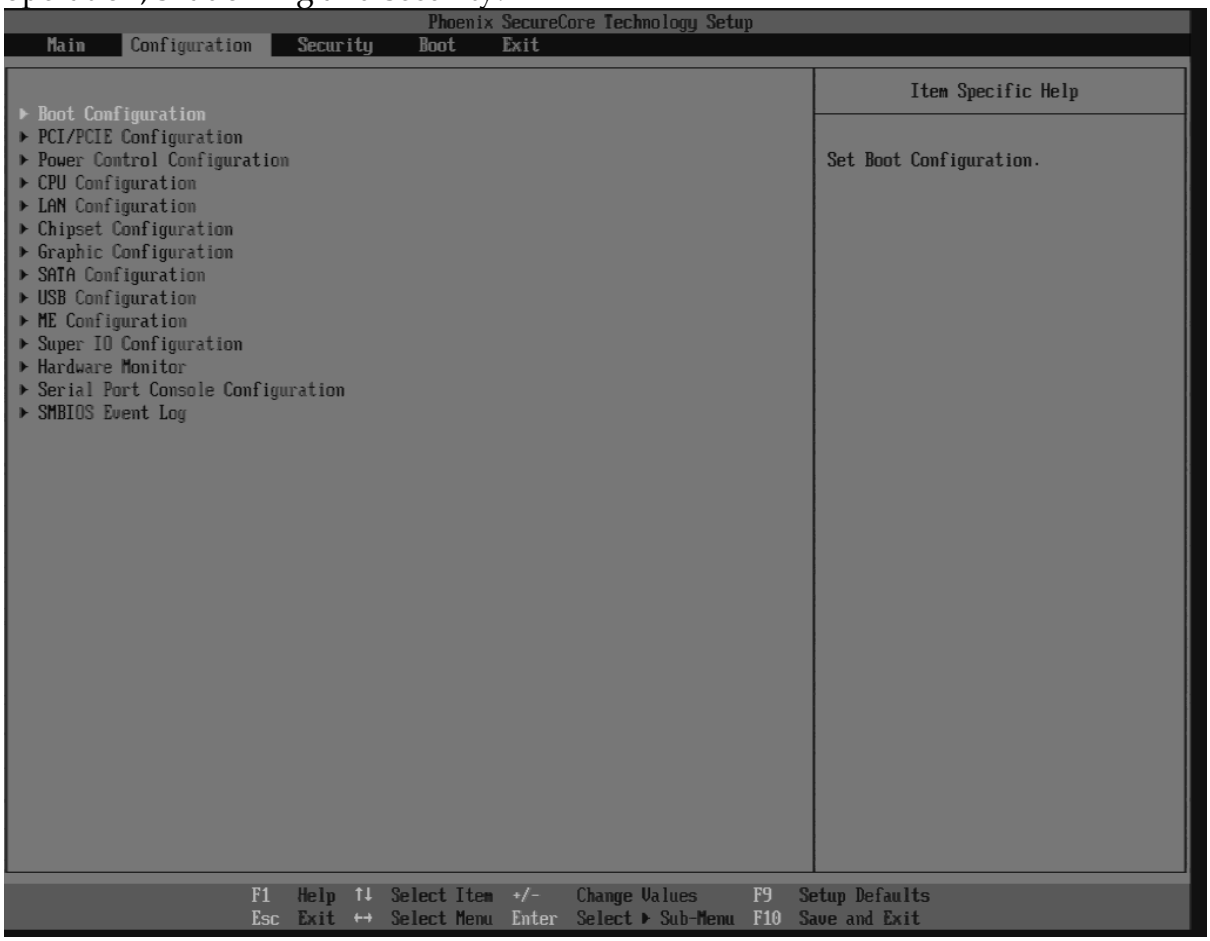
Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
BIOS Version 30426T00
Build Time 04/26/2013
Processor Type Genuine Intel(R) CPU 0000 @ 2.60GHz
Processor Speed 2.600 GHz
Total Memory 2048 MB (DDR3 : 1333Mhz)
System Date [04/29/2013]
System Time [11:47:48]
Access Level Administrator
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

System Data
System date in the format [MM/DD/YYYY]. Use <Enter> or <Tab> to switch through the fields. Adjust the
values with <+> and <->.

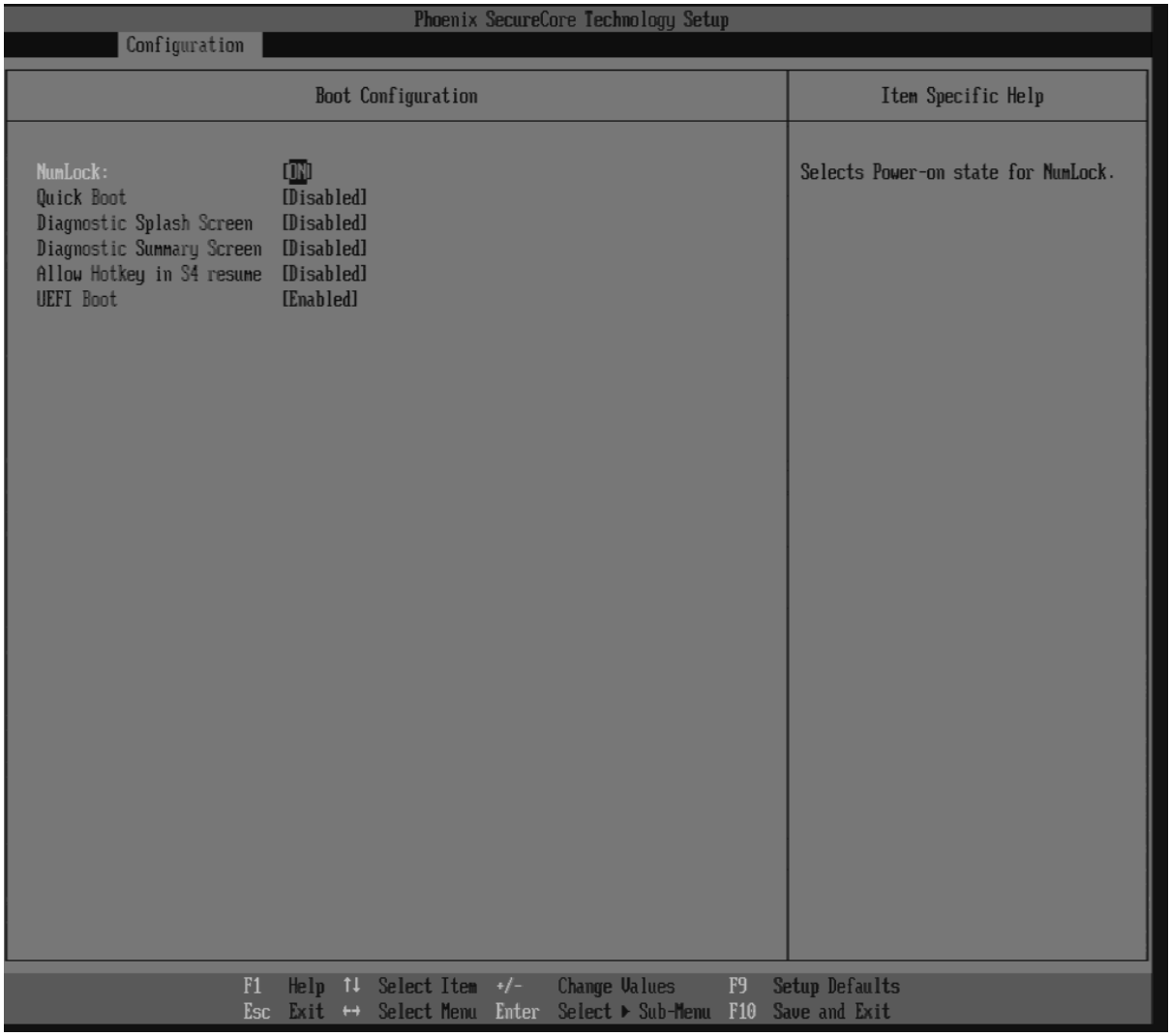
System Time
System Time is in 24-Hour format [hh:mm:ss]. Use <Enter> or <Tab> to switch through the fields. Adjust the
values with <+> and <->.

3.3 Advanced

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



Boot Configuration


Phoenix SecureCore Technology Setup
Configuration
Boot Configuration
Item Specific Help
NumLock: [ON]
Quick Boot [Disabled]
Diagnostic Splash Screen [Disabled]
Diagnostic Summary Screen [Disabled]
Allow Hotkey in S4 resume [Disabled]
UEFI Boot [Enabled]
Selects Power-on state for NumLock.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

NumLock

Select the keyboard Numlock state.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.
The choice: ON, OFF.

Quiet Boot

Enables or disables Quiet Boot option.
This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.
When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

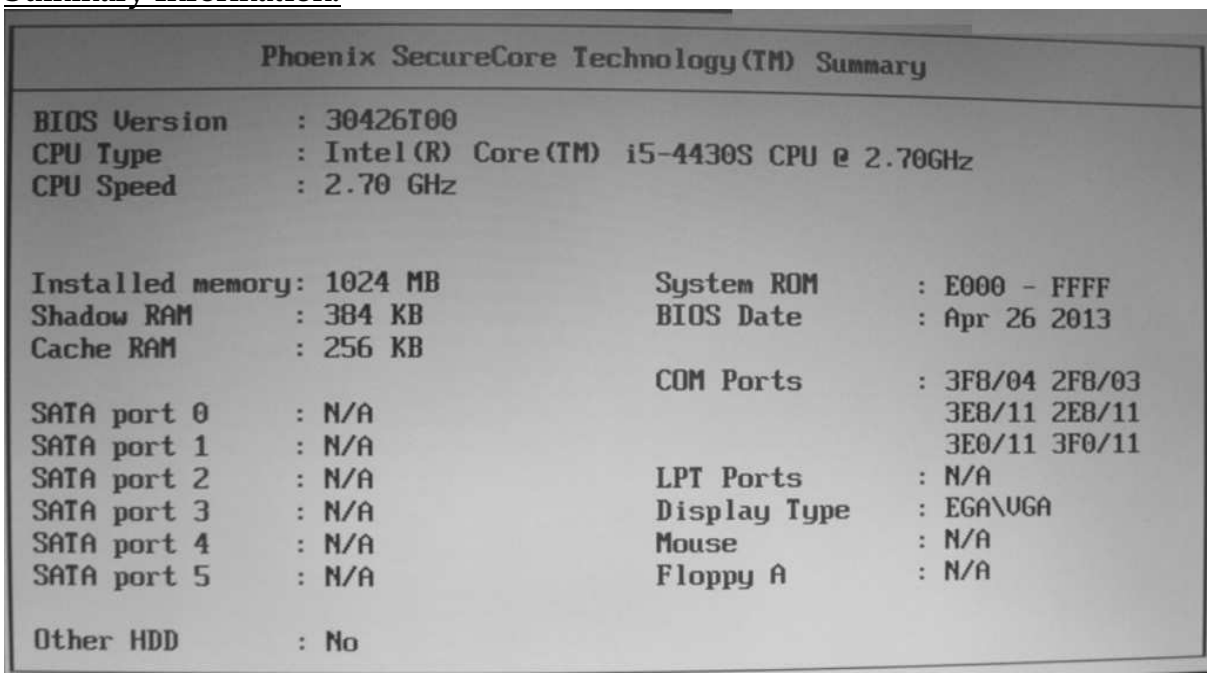
Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient

amount of time. Therefore, it is recommended that you disabled this BIOS feature for a faster boot-up time.
Choices: Disabled, Enabled.

Diagnostic Splash Screen
This item shows a Diagnostic screen during boot up. This screen is also accessible through the App Menu.
The choice: Enabled, Disabled.

Diagnostic Summary Screen
This item shows a Diagnostic Summary Screen during boot up. The boot process will stop by displaying this screen until a key is pressed.
The choice: Enabled, Disabled.

Summary Information:


Phoenix SecureCore Technology(TM) Summary
BIOS Version : 30426T00
CPU Type : Intel(R) Core(TM) i5-4430S CPU @ 2.70GHz
CPU Speed : 2.70 GHz
Installed memory: 1024 MB
Shadow RAM : 384 KB
Cache RAM : 256 KB
SATA port 0 : N/A
SATA port 1 : N/A
SATA port 2 : N/A
SATA port 3 : N/A
SATA port 4 : N/A
SATA port 5 : N/A
Other HDD : No
System ROM : E000 - FFFF
BIOS Date : Apr 26 2013
COM Ports : 3F8/04 2F8/03
3E8/11 2E8/11
3E0/11 3F0/11
LPT Ports : N/A
Display Type : EGA\VGA
Mouse : N/A
Floppy A : N/A

Allow Hotkey in S4 resume
Enable hotkey detection when system resuming from Hibernate stste.
The choice: Enabled, Disabled.

UEFI Boot
This item enables the UEFI Boot. Enable this function if you want to boot UEFI aware operation systems like Windows 7 64Bit or Linux.
The choice: Enabled, Disabled.

PCI/PCIE Configuration

Phoenix SecureCore Technology Setup
Configuration
PCI/PCIE Configuration
PCI Device Setting
SERR# Generation
[Disabled]
PCI Express Setting
▸ Processor PCI Express Configuration
▸ PCH PCI Express Configuration
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SERR# Generation

The choice: Enabled, Disabled.

Processor PCI Express Configuration

Phoenix SecureCore Technology Setup
Configuration
Processor PCI Express Configuration
Item Specific Help
PEG0
PEG0 - Gen X [Gen2]
PEG1
PEG1 - Gen X [Gen2]
PEG2
PEG2 - Gen X [Gen2]
De-emphasis Control [-6 dB]
Configure PEG0 B0:D1:F0 Speed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

PEG0/PEG1/PEG2

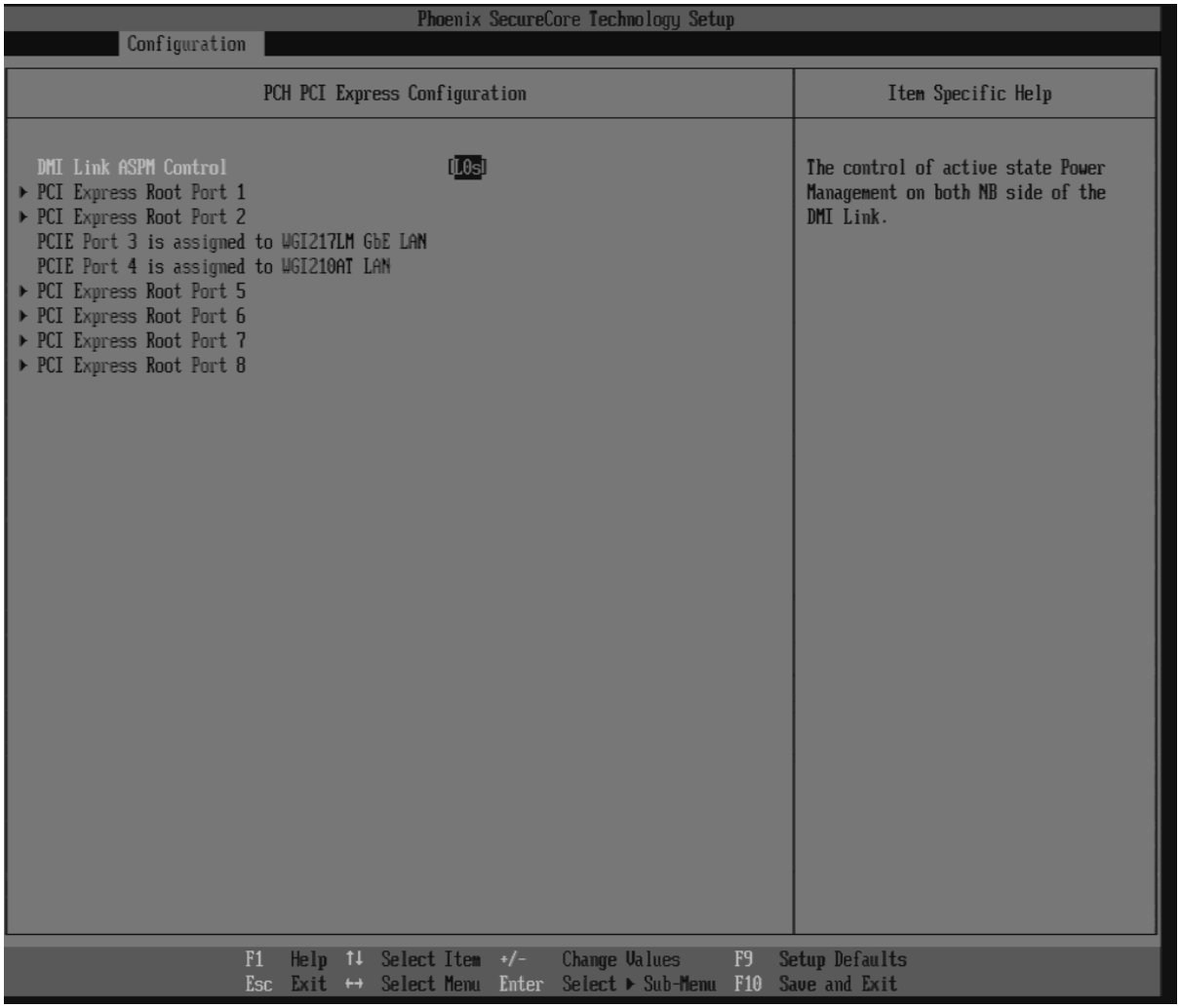
PEG0 – Gen
Configure PEG0 B0:D1:F0 Speed.
The choice: Gen1, Gen2, Gen3.

PEG1 – Gen
Configure PEG0 B0:D1:F1 Speed.
The choice: Gen1, Gen2, Gen3.

PEG2 – Gen
Configure PEG0 B0:D1:F3 Speed.
The choice: Gen1, Gen2, Gen3.

De-emphasis Control
The choice: -6 dB
Choices: Disabled, Enabled.

PCH PCI Express Configuration


Phoenix SecureCore Technology Setup
Configuration
PCH PCI Express Configuration
Item Specific Help
DMI Link ASPM Control [L0s]
PCI Express Root Port 1
PCI Express Root Port 2
PCIE Port 3 is assigned to WGI217LM GbE LAN
PCIE Port 4 is assigned to WGI210AT LAN
PCI Express Root Port 5
PCI Express Root Port 6
PCI Express Root Port 7
PCI Express Root Port 8
The control of active state Power Management on both NB side of the DMI Link.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

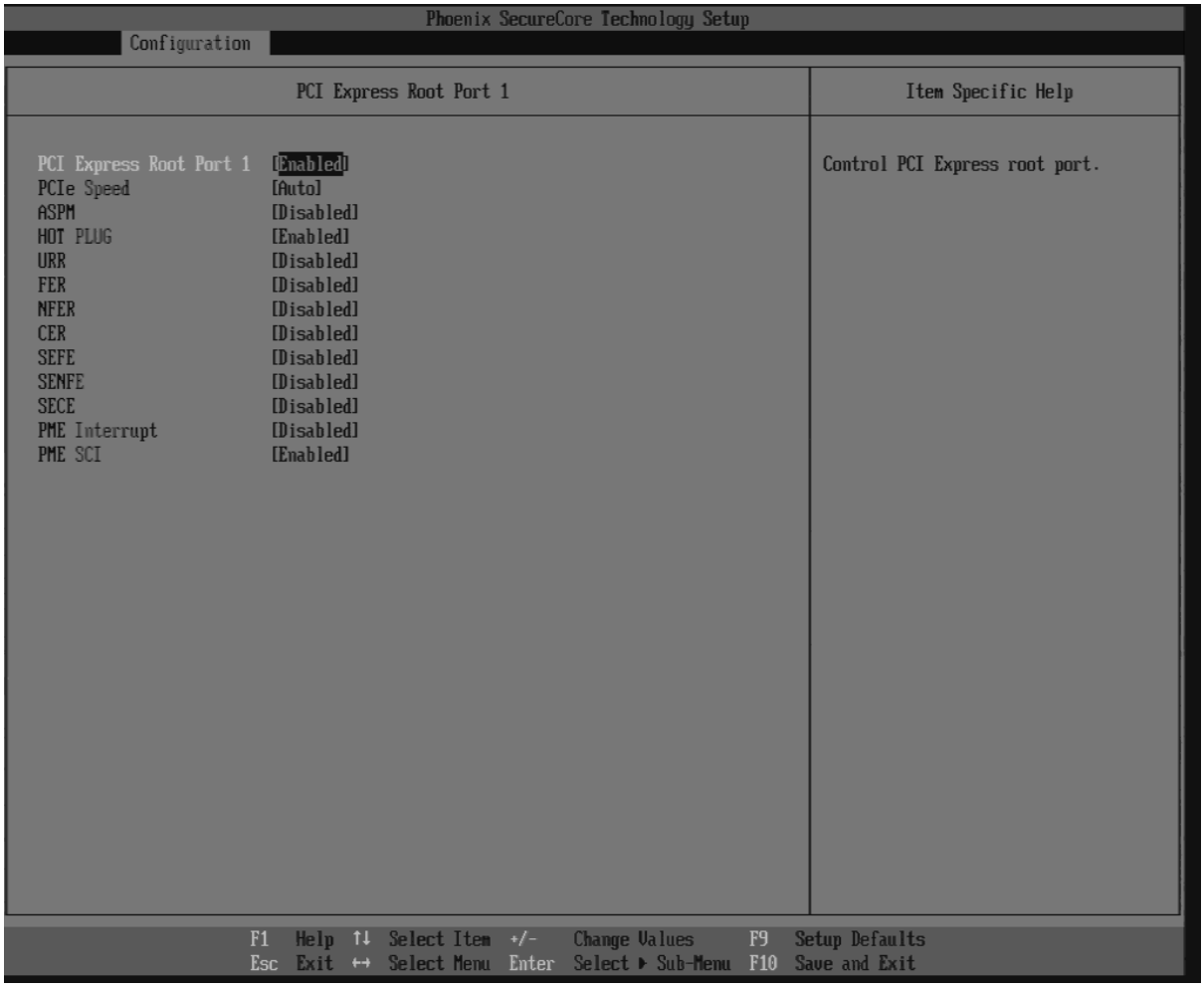
DMI Link ASPM Control

The control of active state Power Management on both NB side of the DMI Link. The choice: Disabled, L0s, L1, L0sL1.

PCIE Port 3 is assigned to WGI217LM GbE LAN

PCIE Port 4 is assigned to WGI210AT GbE LAN

PCI Express Root Port 1/2/5/6/7/8



PCI Express Root Port 1/2/5/6/7/8
Control the PCI Express Root Port.
The choice: Enabled, Disabled.

PCIe Speed
Select PCIe Speed to Gen1 or Gen2.
The choice: Auto, Gen1, Gen2.

ASPM
Control PCIe Active State Power Management settings.
The choice: Disabled, L0S, L1, L0S and L1, Auto.

HOT PLUG
Enable or disable PCI Express Hot Plug.
The choice: Enabled, Disabled.

URR
Enable or disable PCI Express Unsupported Request Reporting.
The choice: Enabled, Disabled.

FER
Enable or disable PCI Express Device Fatal Error Reporting.
The choice: Enabled, Disabled.

NFER
Enable or disable PCI Express Device Non-Fatal Error Reporting.
The choice: Enabled, Disabled.

CER
Enable or disable PCI Express Device Correctable Error Reporting.
The choice: Enabled, Disabled.

SEFE
Enable or disable Root PCI Express System Error on Fatal Error.
The choice: Enabled, Disabled.

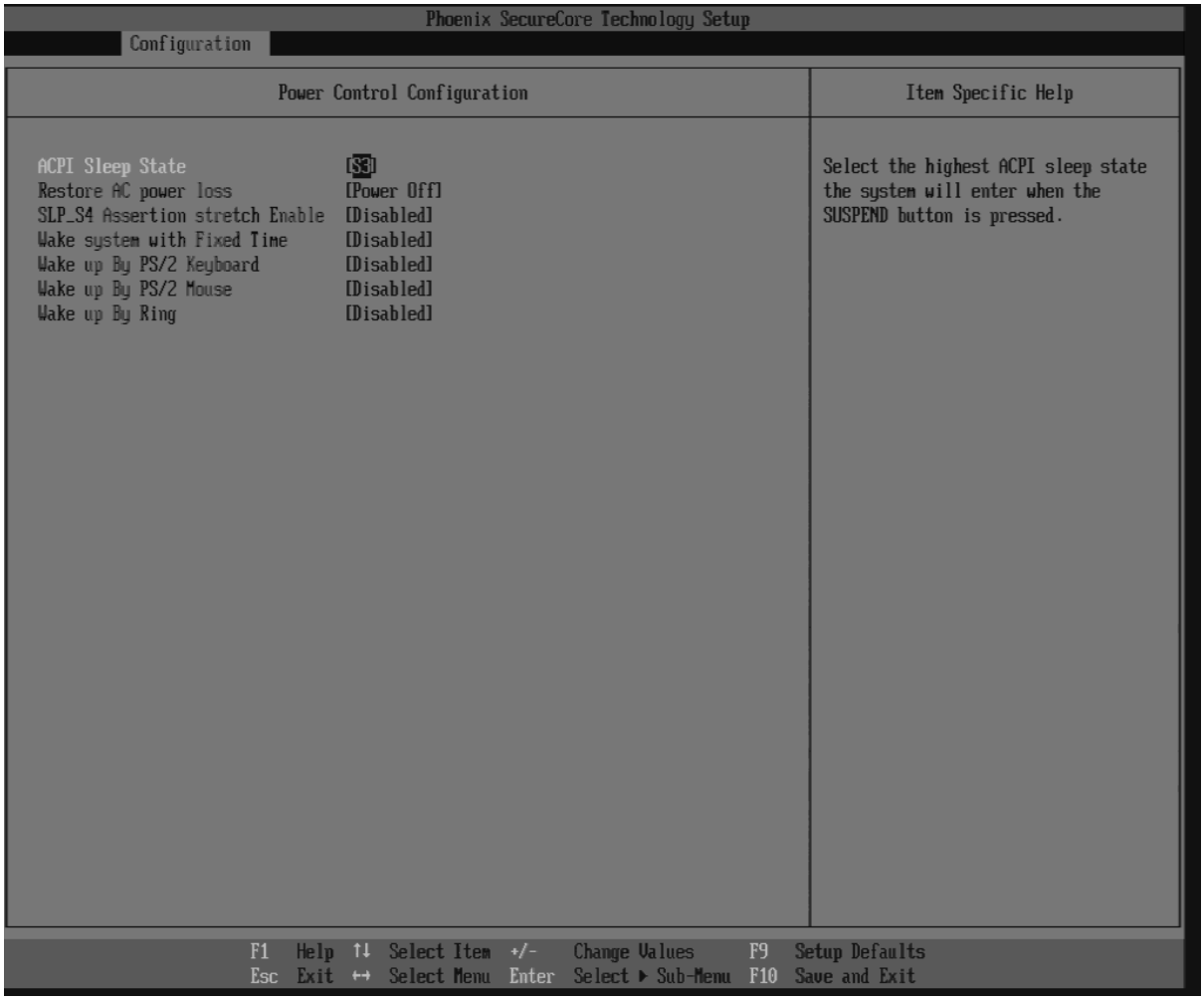
SENFE
Enable or disable Root PCI Express System Error on Non-Fatal Error.
The choice: Enabled, Disabled.

SECE
Enable or disable Root PCI Express System Error on Correctable Error.
The choice: Enabled, Disabled.

PME Interrupt
Enable or disable PCI Express PME Interrupt.
The choice: Enabled, Disabled.

PME SCI
PCI Express PME SCI Enable/Disable.
The choice: Enabled, Disabled.

Power Control Configuration


Phoenix SecureCore Technology Setup
Configuration
Power Control Configuration
Item Specific Help
ACPI Sleep State [S3]
Restore AC power loss [Power Off]
SLP_S4 Assertion stretch Enable [Disabled]
Wake system with Fixed Time [Disabled]
Wake up By PS/2 Keyboard [Disabled]
Wake up By PS/2 Mouse [Disabled]
Wake up By Ring [Disabled]
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
The choice: S3.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.
The choice: Power Off, Power On, Last State.

SPL_S4 Assertion stretch Enable

The choice: Enabled, Disabled.

Wake system with Fixed Time

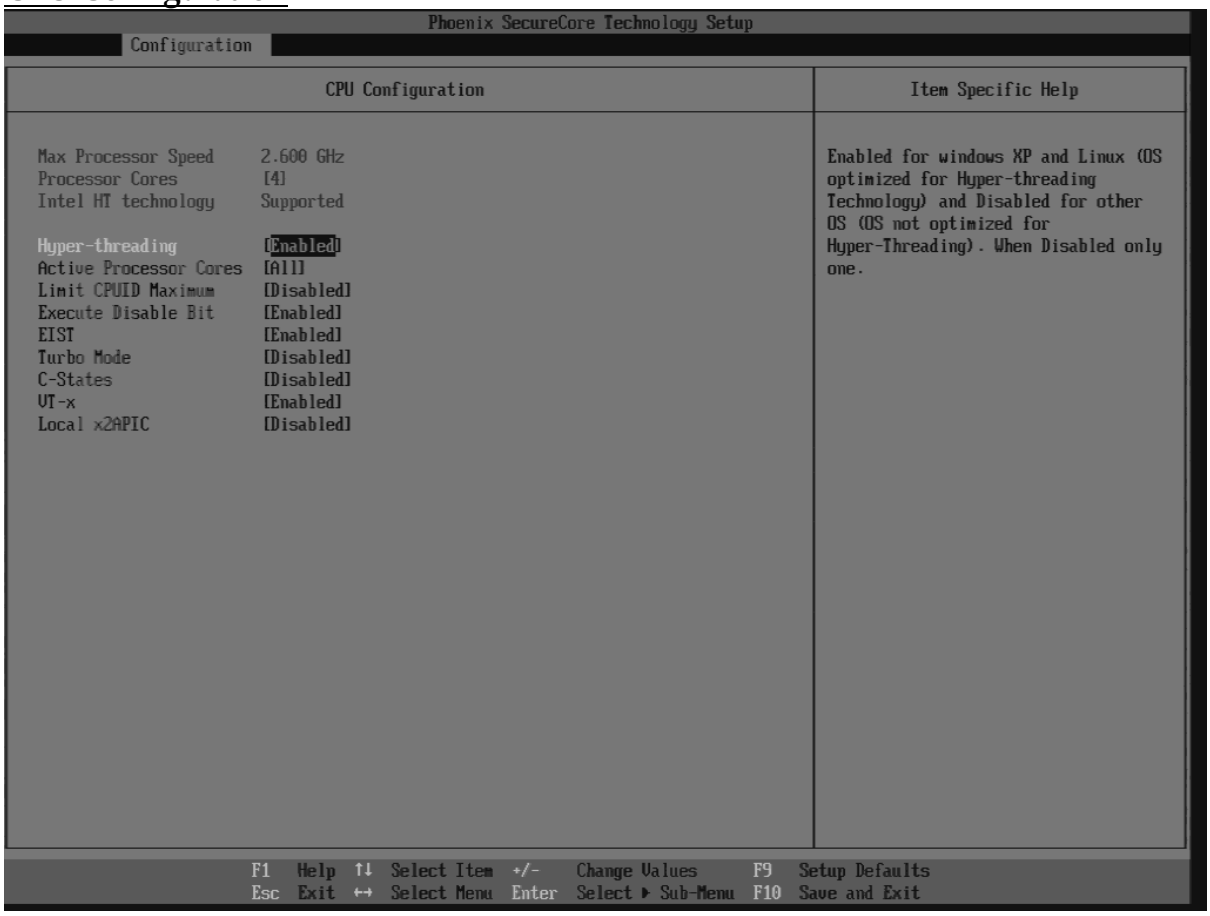
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
The choice: Enabled, Disabled.

Wake up By PS/2 Keyboard
Enable or disable integrated PS/2 Keyboard to wake the system.
The choice: Enabled, Disabled.

Wake up By PS/2 Mouse
Enable or disable integrated PS/2 Mouse to wake the system.
The choice: Enabled, Disabled.

Wake up By Ring
Enable or disable Ring to wake the system.
The choice: Enabled, Disabled.

CPU Configuration


Phoenix SecureCore Technology Setup
Configuration
CPU Configuration
Item Specific Help
Max Processor Speed 2.600 GHz
Processor Cores [4]
Intel HT technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
EIST [Enabled]
Turbo Mode [Disabled]
C-States [Disabled]
VT-x [Enabled]
Local x2APIC [Disabled]
Enabled for windows XP and Linux (OS optimized for Hyper-threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading). When Disabled only one.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Hyper-threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper- Threading Technology). When Disabled only one.
The choice: Enabled, Disabled.

Active Processor Cores
Number of cores to enable in each processor package.
The choice: All, 1, 2, 3.

Limit CPUID Maximum
Disabled for Windows XP.
The choice: Enabled, Disabled.

Execute Disable Bit
Enabled Execute Disabled functionality. Also known as Data Execution Prevention (DEP).
The choice: Enabled, Disabled.

EIST
Enable/Disable Intel SpeedStep

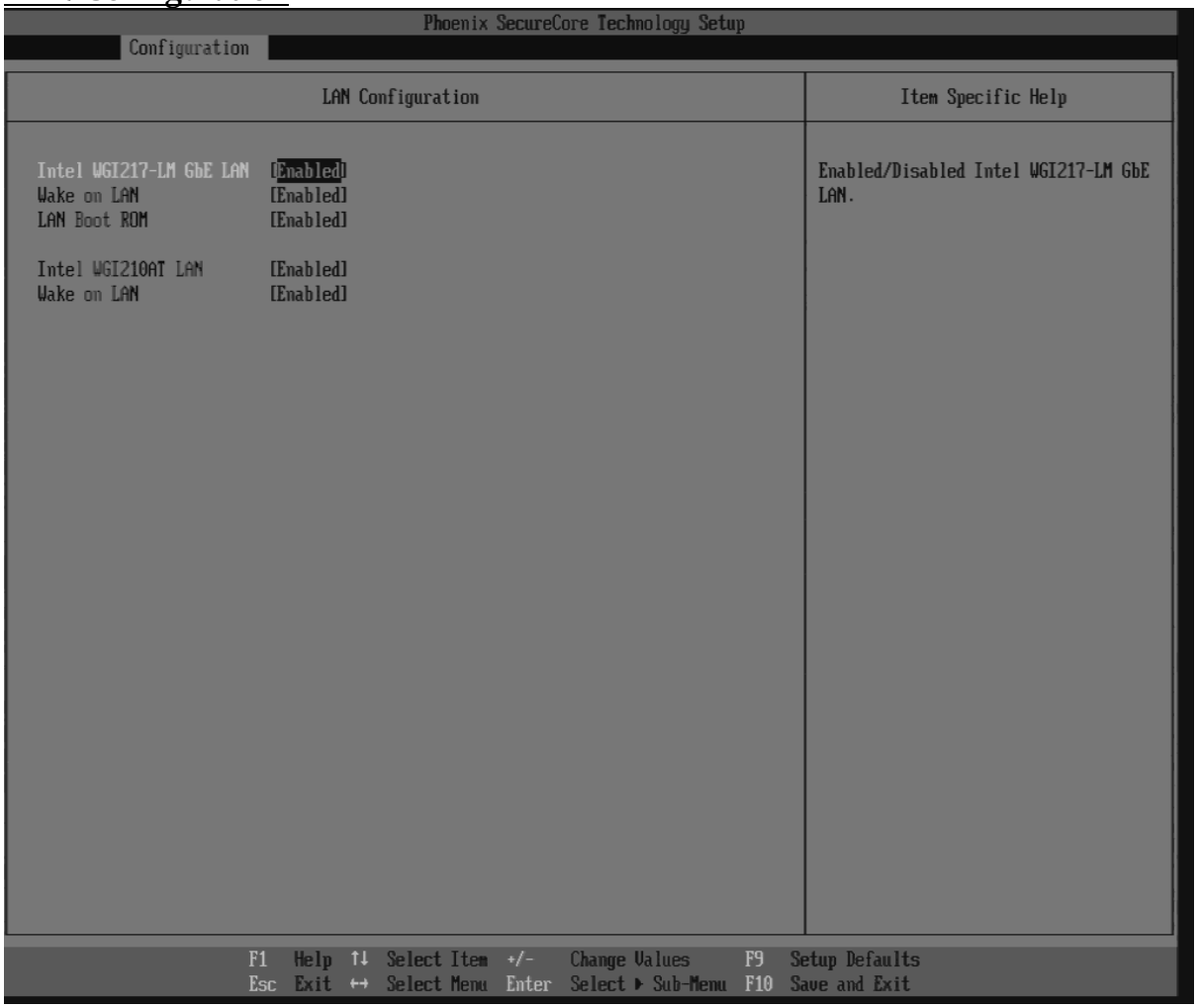
Turbo Mode
Enable processor Turbo Mode. EMTTM must also be enabled.
The choice: Enabled, Disabled.

C-States
Enable processor idle power saving states (C-States).
The choice: Enabled, Disabled.

VT-x
When enabled, a VWM can utilize the additional hardware capabilities provided by Vanderpool Technology
The choice: Enabled, Disabled.

Local x2APIC
Enable Local x2APIC. Some 0Ses do not support this.
The choice: Enabled, Disabled.

LAN Configuration


Phoenix SecureCore Technology Setup
Configuration
LAN Configuration
Item Specific Help
Intel WGI217-LM GbE LAN [Enabled]
Wake on LAN [Enabled]
LAN Boot ROM [Enabled]
Intel WGI210AT LAN [Enabled]
Wake on LAN [Enabled]
Enabled/Disabled Intel WGI217-LM GbE LAN.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel WGI217-LM GbE LAN

Enabled/Disabled Intel WGI217-LM GbE LAN.
The choice: Enabled, Disabled.

Wake on LAN

Enable/Disable wake on LAN Function.
The choice: Enabled, Disabled.

LAN Boot ROM

Enable or disable integrated LAN Boot ROM(PXE) function.
The choice: Enabled, Disabled.

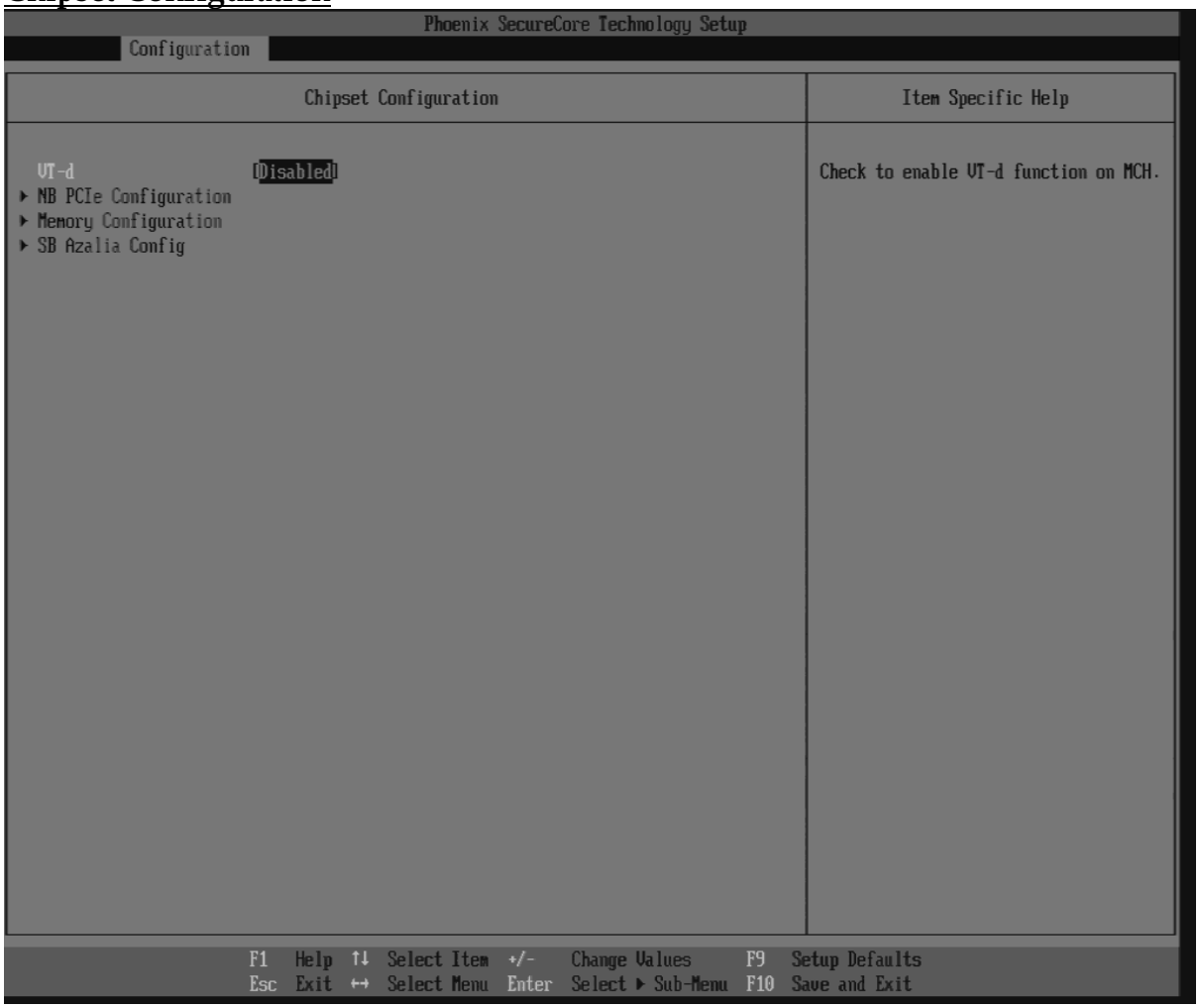
Intel WGI210AT LAN

Enabled/Disabled Intel WGI210AT LAN.
The choice: Enabled, Disabled.

Wake on LAN

Enable/Disable wake on LAN Function.
The choice: Enabled, Disabled.

Chipset Configuration


Phoenix SecureCore Technology Setup
Configuration
Chipset Configuration
Item Specific Help
VT-d [Disabled]
NB PCIe Configuration
Memory Configuration
SB Azalia Config
Check to enable VT-d function on MCH.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

VT-d

Check to enable VT-d function on MCH.
The choice: Disabled, Enabled.

NB PCIe Configuration

Config NB PCI Express Settings.

Phoenix SecureCore Technology Setup
Configuration
NB PCIe Configuration
Item Specific Help
Always Enable PEG [Enabled]
PEG ASPM [Disabled]
To Enable the PEG Slot.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Always Enable PEG

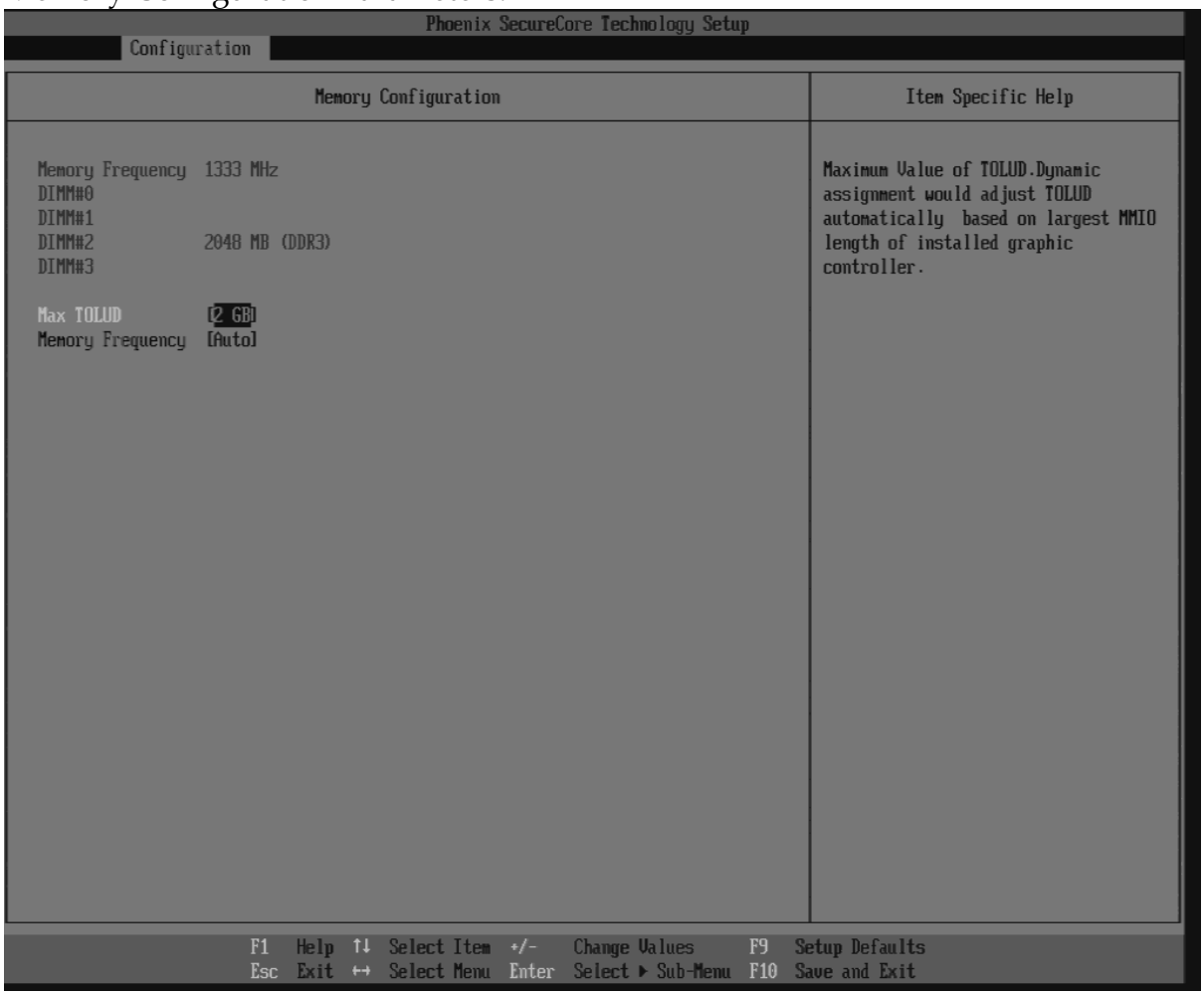
To Enable the PEG Slot.
The choice: Disabled, Enabled.

PEG ASPM

Control ASPM Support for the PEG Device. This has mp effect if PEF is not the current active device.
The choice: Disabled, ASPM L0s, ASPM L1, ASPM L0sL1.

Memory Configuration

Memory Configuration Parameters.


Phoenix SecureCore Technology Setup
Configuration
Memory Configuration
Item Specific Help
Memory Frequency 1333 MHz
DIMM#0
DIMM#1
DIMM#2 2048 MB (DDR3)
DIMM#3
Max TOLUD [2 GB]
Memory Frequency [Auto]
Maximum Value of TOLUD.Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Max TOLUD

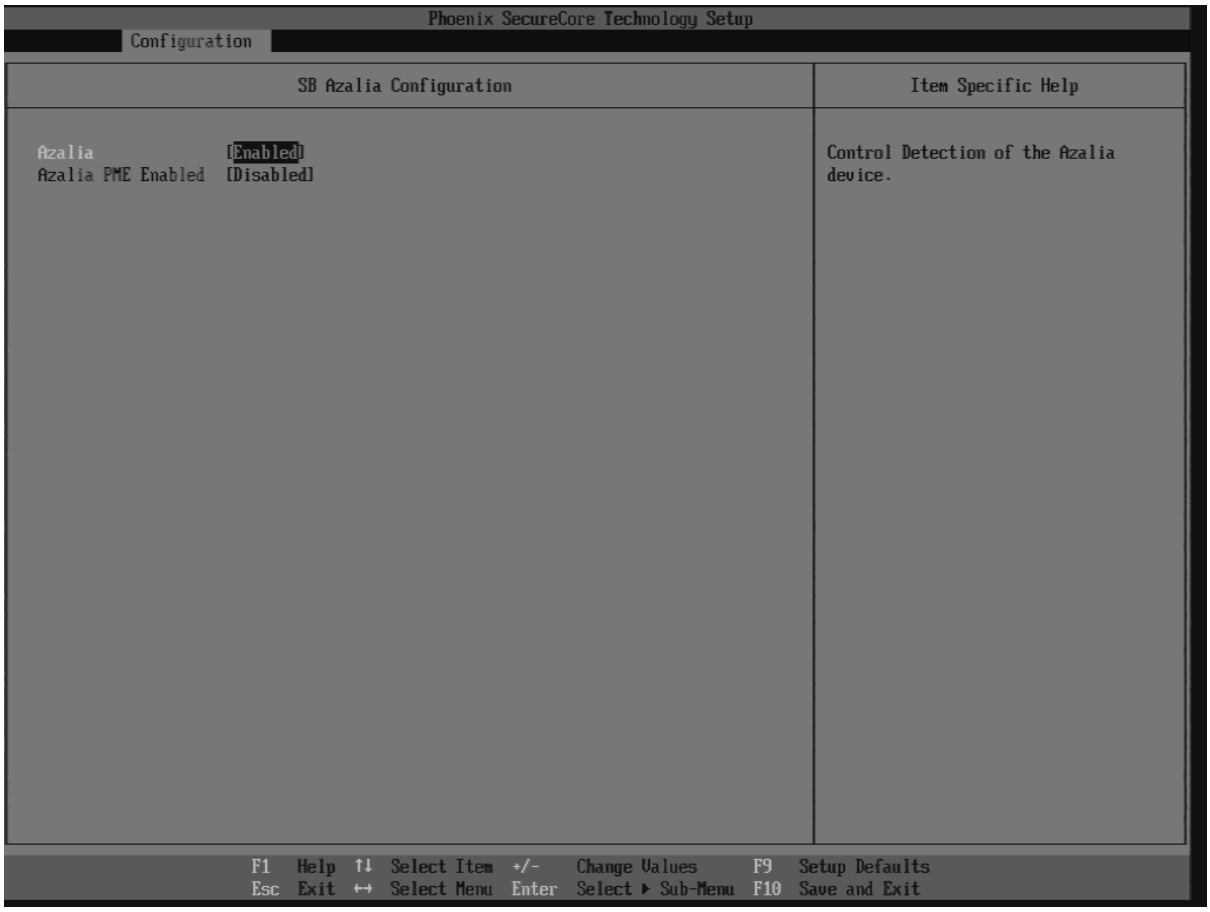
Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on larges MMIO length of installed graphic controller.
The choice: Dynamic, 1GB, 1.25 GB, 1.5 GB, 1.75GB, 2GB, 2.25GB, 2.5GB, 2.75GB, 3GB, 3.25GB.

Memory Frequency

Maximum Memory Frequency Selections in Mhz.
The choice: Auto, 1067, 1333, 1600, 1867, 2133.

SB Azalia Configuration

Control Detection of the Azalia device.


Phoenix SecureCore Technology Setup
Configuration
SB Azalia Configuration
Item Specific Help
Azalia [Enabled]
Azalia PME Enabled [Disabled]
Control Detection of the Azalia device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Azalia

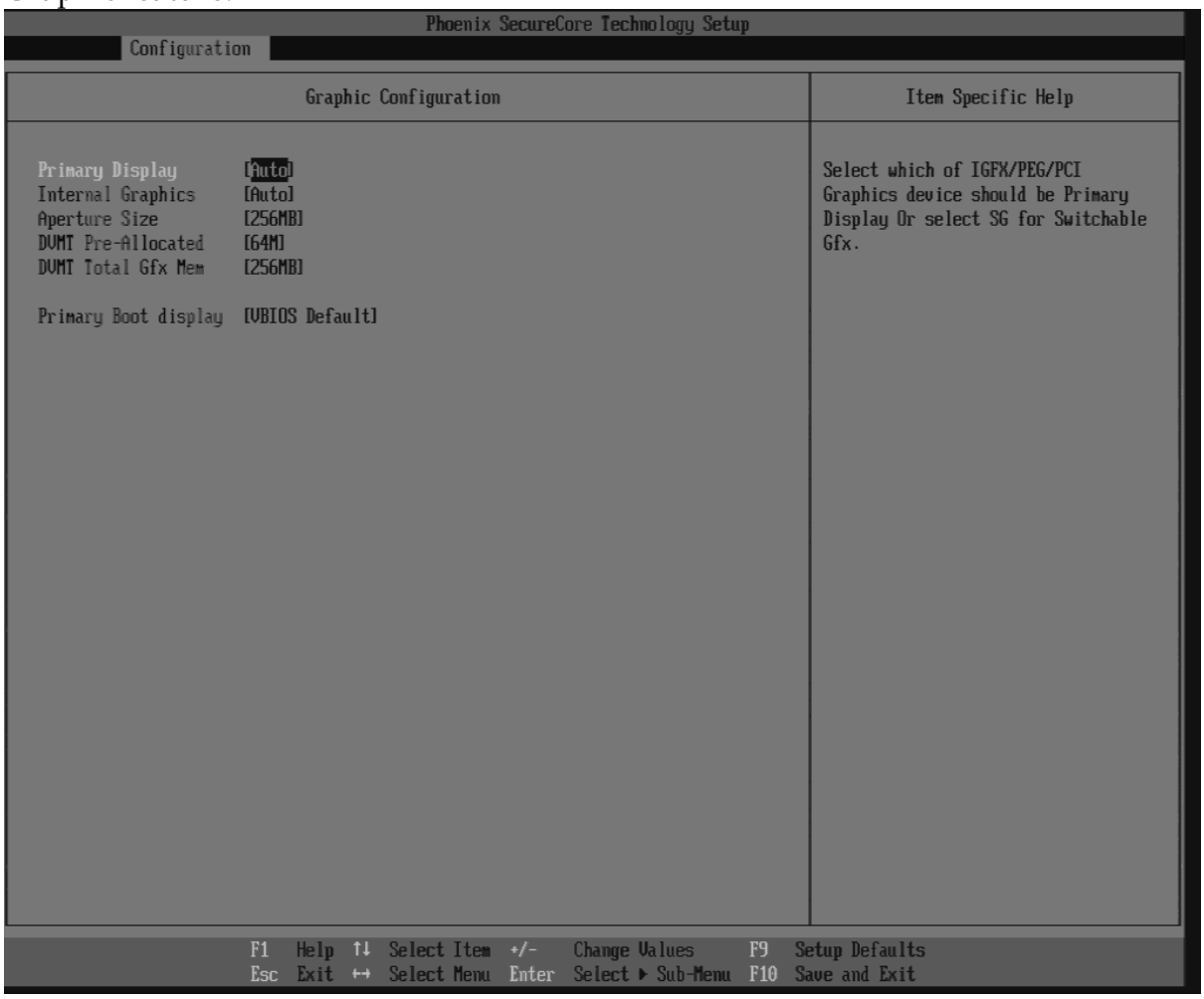
Control Detection of the Azalia device.
The choice: Disabled, Enabled.

Azalia PME Enabled

Enable/Disable PME for Azalia.
The choice: Disabled, Enabled.

Graphic Configuration

Configure integrated Graphic like Boot display , video memory and external Graphic feature.


Phoenix SecureCore Technology Setup
Configuration
Graphic Configuration
Item Specific Help
Primary Display [Auto]
Internal Graphics [Auto]
Aperture Size [256MB]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256MB]
Primary Boot display [VBIOS Default]
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Choices: Auto, IGFX, PEG, PCI.

Internal Graphics

Keep IGD Enabled based on the setup options
Choices: Auto, Disabled, Enabled.

Aperture Size

Select the Aperture Size.
Choices: 128MB, 256MB, 512MB.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the internal Graphic Device.
Choices: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M.

DVMT Total Gfx Mem
Select DVMT 5.0 Total Graphic Memory size used by the internal Graphic Device.
Choices: 128MB, 256MB, MAX.

Primary Boot display
Choices: VBIOS Default, CRT, DP>HDMI, HDMI.

SATA Configuration
Configure SATA controller and view detected HDD information.

Phoenix SecureCore Technology Setup
Configuration
SATA Configuration
Item Specific Help
SATA Controller(s) [Enabled]
Launch Storage OpROM [Disabled]
SATA Mode [AHCI]
Serial ATA Port 0 [Empty]
Port 0 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 1 [Empty]
Port 1 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 2 [Empty]
Port 2 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 3 [Empty]
Port 3 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 4 [Empty]
Hard disk 4 [Empty]
Port 4 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 5 [Empty]
Hard disk 5 [Empty]
Port 5 [Enabled]
Enable/Disable SATA Device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SATA Controller (s)
Determines how SATA controller (s) operate.
Choices: Disabled, Enabled.

Launch Storage OpROM
Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.
Choices: Enabled, Disabled.

SATA Mode
Determines how SATA controller (s) operate.
Choices: IDE, AHCI, RAID.

Serial ATA Port 0-5
Display the identity of the device attached.

Port 0-5
Enable or Disable SATA Port 0-5.
Choices: Enabled, Disabled.

Hot Plug
Designates this port as Hot Pluggable.
Choices: Enabled, Disabled.

External Port
External SATA Support.
Choices: Enabled, Disabled.

SATA Device Type
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Choices: Hard Disk Driver, Solid State Driver.

USB Configuration

Configure USB controller and other advanced setting.

Phoenix SecureCore Technology Setup
Configuration
USB Configuration
Item Specific Help
Legacy USB Support [Enabled]
PCH USB Configuration
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

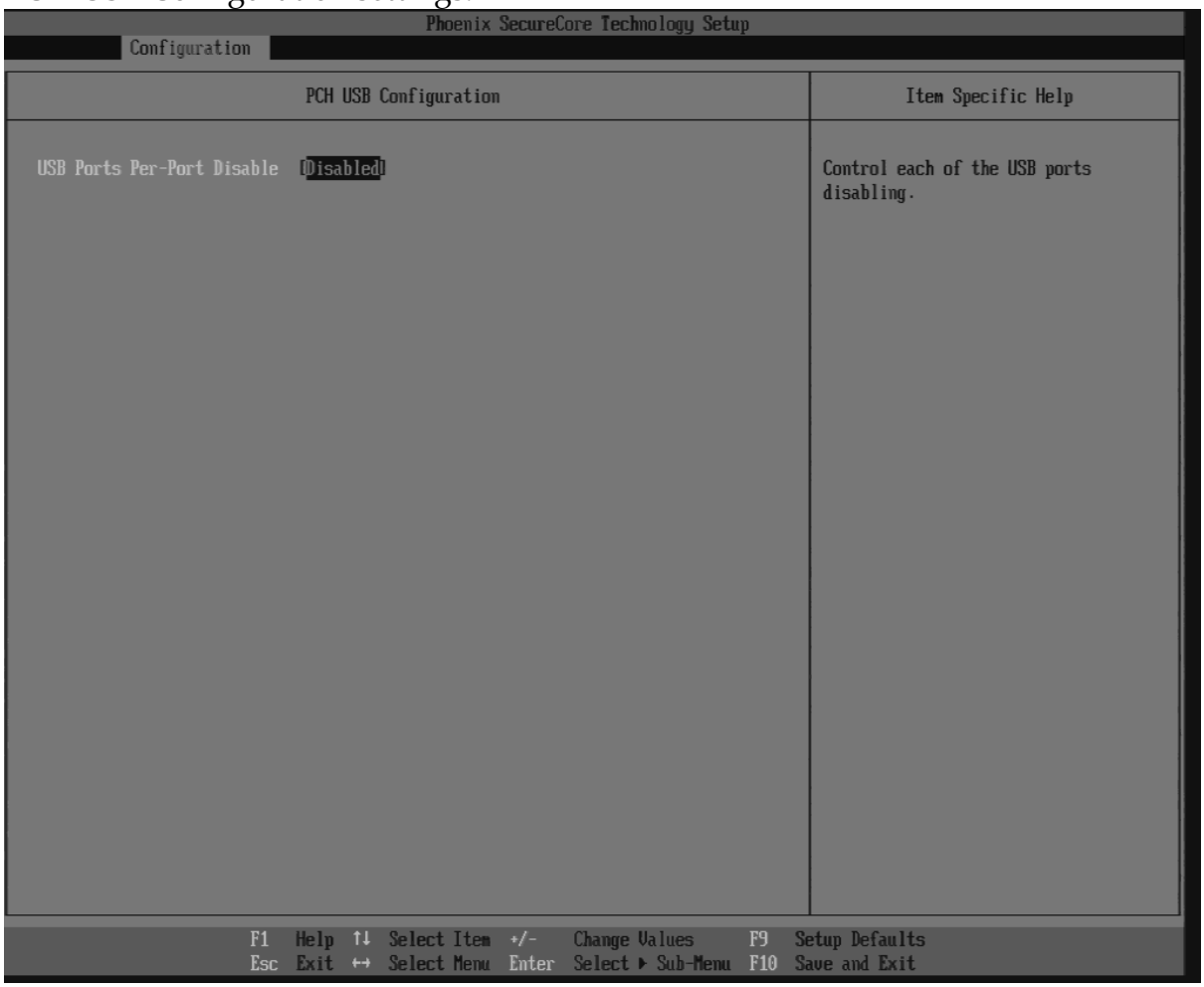
Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Choices: Enabled, Disabled.

PCH USB Configuration

PCH USB Configuration settings.


Phoenix SecureCore Technology Setup
Configuration
PCH USB Configuration
Item Specific Help
USB Ports Per-Port Disable [Disabled]
Control each of the USB ports disabling.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

USB Ports Per-Port Disable

Control each of the USB ports disabling.
Choices: Enabled, Disabled.

ME Configuration

Configure Management Engine Technology Parameters.

Phoenix SecureCore Technology Setup
Configuration
ME Configuration
Item Specific Help
ME FW Version 0.0.0.0
ME Firmware Unknown
Intel(R) ME [Enabled]
ME FW Downgrade [Disabled]
Enable/Disable Intel(R) Management Engine.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel (R) ME

Enable/Disable Intel (R) Management Engine.
Choices: Enabled, Disabled.

ME FW Downgrade

Enable/Disable ME FW Downgrade function.
Choices: Enabled, Disabled.

Super IO Configuration

Configure LPC Super IO.

Phoenix SecureCore Technology Setup
Configuration
SIO Configuration
Item Specific Help
Serial Port
Serial Port 1 [3F8 / IRQ4]
Serial Port 2 [2F8 / IRQ3]
Serial Port 3 [3E8 / IRQ11]
Serial Port 4 [2E8 / IRQ11]
Serial Port 5 [3E0 / IRQ11]
Serial Port 6 [3F0 / IRQ11]
Serial Port
COM2 Configuration [RS-232]
Serial Port
COM6 Configuration [RS-232]
Watch Dog Timer
Watch Dog Timer Select [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Serial Port 1

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 2

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 3

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 4

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 5

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 6

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

COM2 Configuration
Choices: RS-232, RS-422, RS-485.

COM6 Configuration
Choices: RS-232, RS-422, RS-485.

Watch Dog Timer Select
Choices: Disabled, 30 secs, 1 min, 2 mins, 3 mins.

Hardware Monitor
Provide on board sensor reading information.

Phoenix SecureCore Technology Setup
Configuration
Hardware Monitor
CPU Fan Feature
CPU Temperature [45 °C]
System Temperature [46 °C]
CPU Fan [2721 RPM]
System Fan [N/A]
VCORE [1.78 V]
1.5V [1.48 V]
12V [12.28 V]
5V [5.11 V]
3.3V [3.39 V]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

CPU Fan Feature

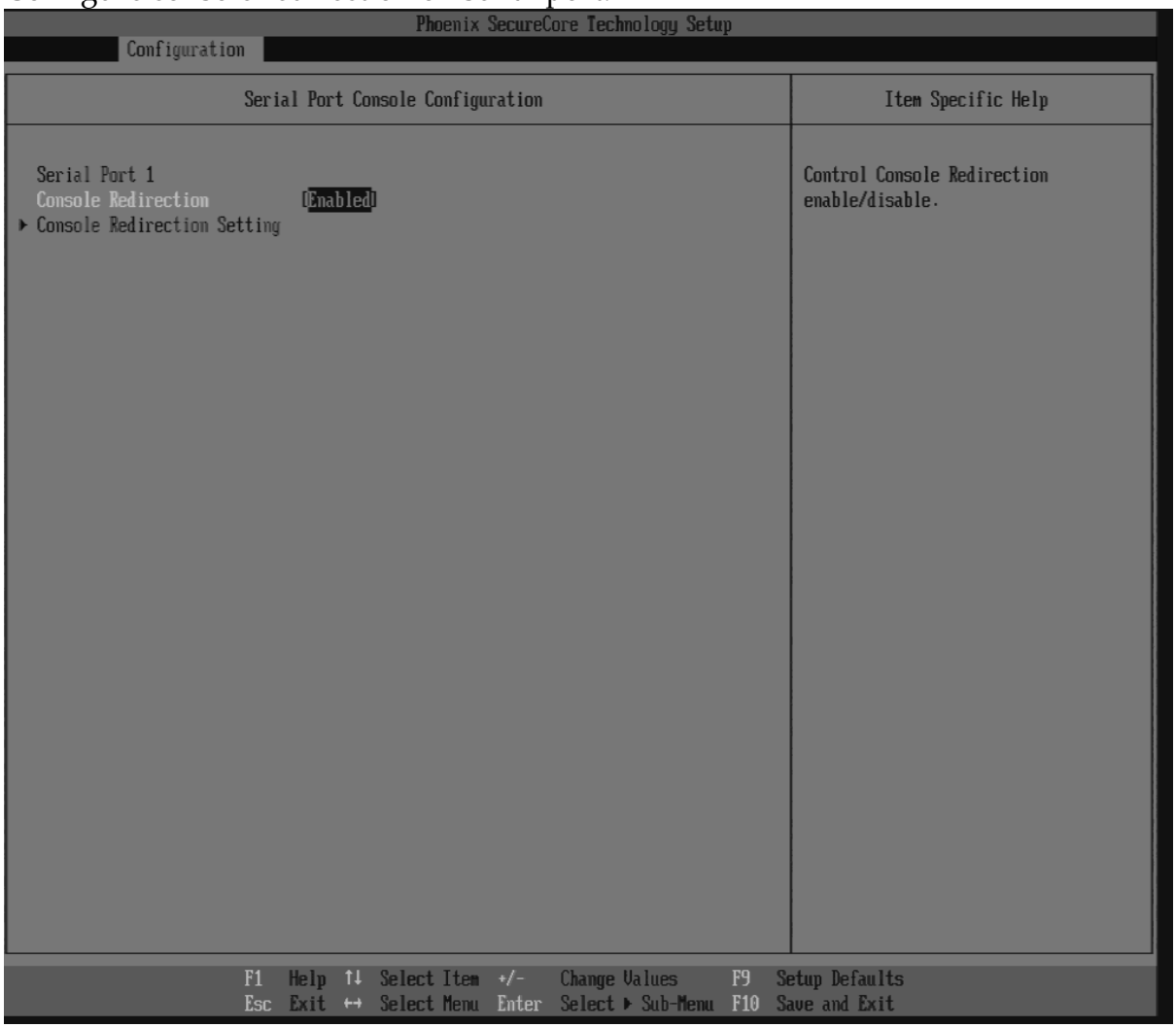
Phoenix SecureCore Technology Setup
Configuration
Smart Fan Control Feature
CPU Fan Control
Smart Fan Control [Disabled]
System Fan Control
Smart Fan Control [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Smart Fan Control
Choices: Enabled, Disabled.

Smart Fan Control
Choices: Enabled, Disabled

Serial Port Console Configuration

Configure console redirection on serial port.


Phoenix SecureCore Technology Setup
Configuration
Serial Port Console Configuration
Item Specific Help
Serial Port 1
Console Redirection [Enabled]
Console Redirection Setting
Control Console Redirection enable/disable.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Console Redirection

Control Console Redirection enable/disable.
Choices: Enabled, Disabled

SMBIOS Event Log

Manage SMBIOS Event Log

Phoenix SecureCore Technology Setup
Configuration
SMBIOS Event Log
Item Specific Help
Clears SMBIOS events [Enter]
▸ View SMBIOS event log
Clears SMBIOS events.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

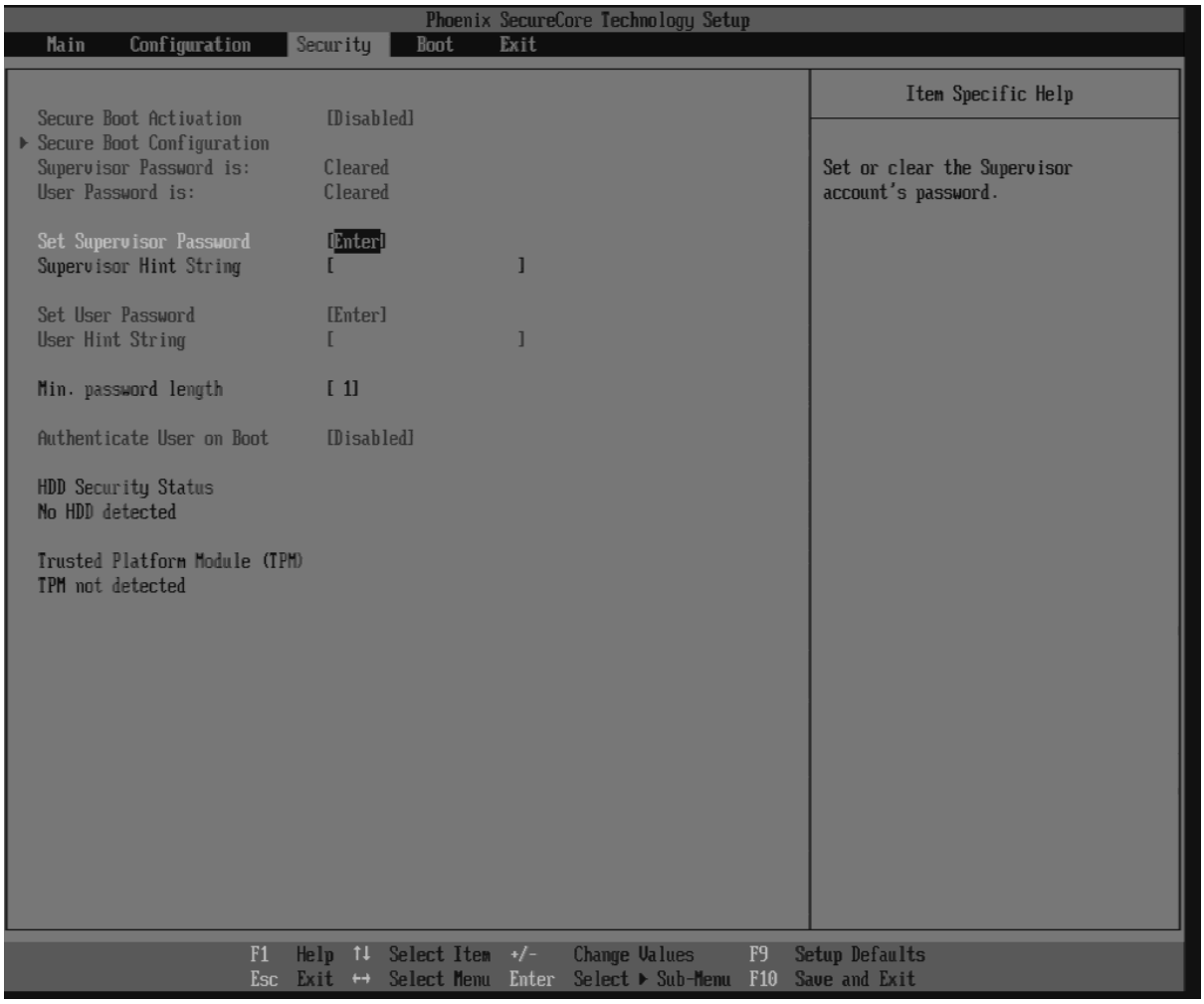
Clears SMBIOS events

View SMBIOS event log

Phoenix SecureCore Technology Setup
Configuration
View SMBIOS event log
Event Log is empty.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

3.4 Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program. Some systems have a single password, while many newer ones now have two: a supervisor and a user password.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Item Specific Help
Secure Boot Activation [Disabled]
Secure Boot Configuration
Supervisor Password is: Cleared
User Password is: Cleared
Set Supervisor Password [Enter]
Supervisor Hint String [ ]
Set User Password [Enter]
User Hint String [ ]
Min. password length [1]
Authenticate User on Boot [Disabled]
HDD Security Status
No HDD detected
Trusted Platform Module (TPM)
TPM not detected
Set or clear the Supervisor account's password.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

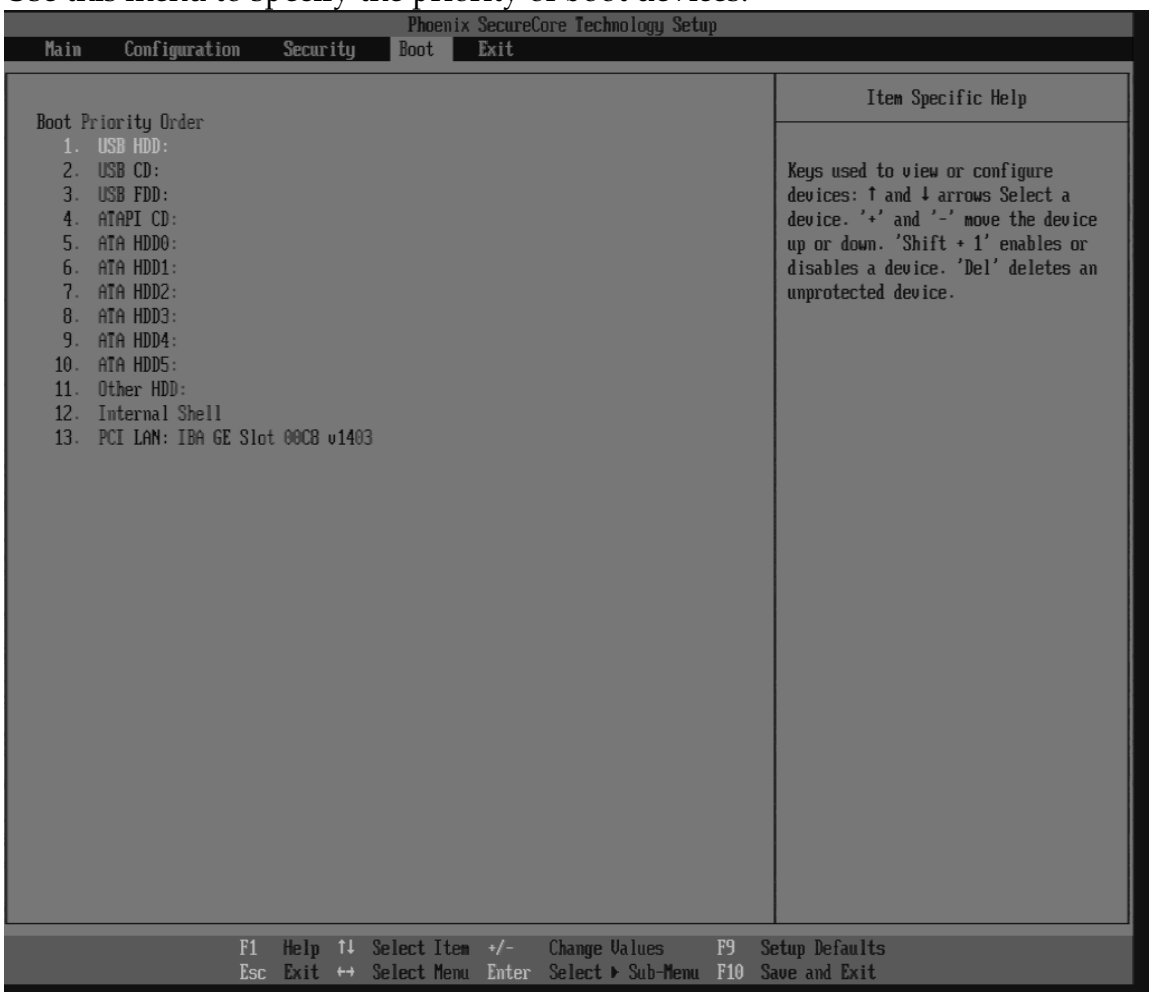
Set Supervisor Password
Set or clear Supervisor account's Password

Supervisor User Hint String
Press Enter to type Supervisor Hint String.

Min. password length
Set the minimum number of characters for password (1-20).

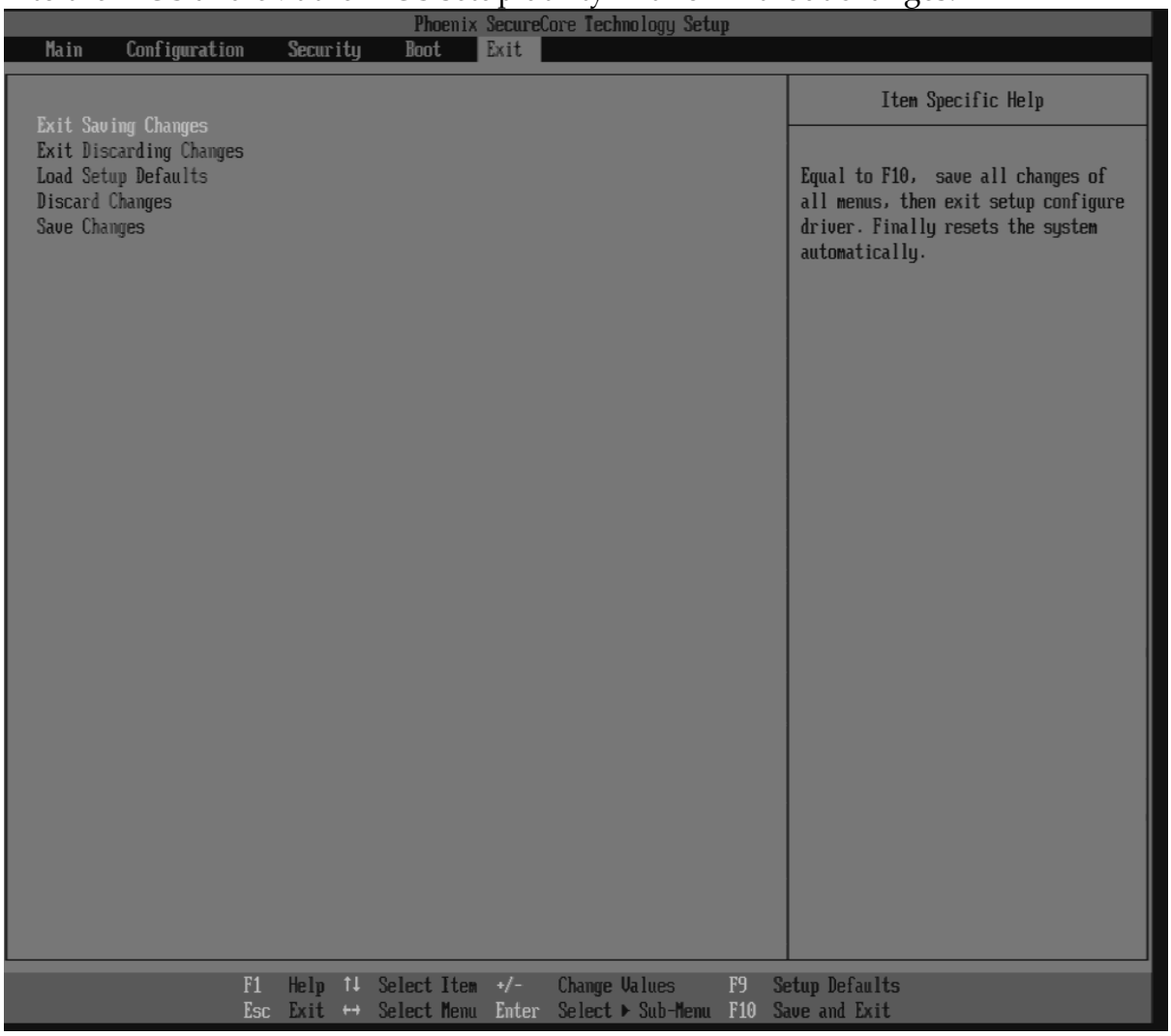
3.5 Boot

Use this menu to specify the priority of boot devices.


Phoenix SecureCore Technology Setup
Main Configuration Security Boot Exit
Boot Priority Order
1. USB HDD:
2. USB CD:
3. USB FDD:
4. ATAPI CD:
5. ATA HDD0:
6. ATA HDD1:
7. ATA HDD2:
8. ATA HDD3:
9. ATA HDD4:
10. ATA HDD5:
11. Other HDD:
12. Internal Shell
13. PCI LAN: IBA GE Slot 00C8 v1403
Item Specific Help
Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-' move the device up or down. 'Shift + 1' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

3.6 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Exit Saving Changes
Equal to F10, save all changes of all menus, then exit system setup configure setup configure driver. Finally resets the system automatically.
Exit Discarding Changes
Equal to ESC, never save changes, then exit setup configure driver.

Load Setup Defaults
Equal to F9. Load standard default values.

Discard Changes
Load the original value of this boot time. Not the default Setup value.

Save Changes
Save all changes of all menus, but do not reset system.

Chapter 4
Important Instructions

This chapter includes instructions which must be carefully followed when the fan-less embedded system is used.

4.1 Note on the Warranty

Due to their limited service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

We shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), we shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

EMC
CE/FCC Class A
This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.
Applicable Standards:
EN 55022: 2006 + A1: 2007, Class A
EN 61000-3-2: 2006
EN 61000-3-3: 1995 + A1: 2001 + A2: 2005
EN 55024: 1998 + A1: 2001 + A2: 2003
IEC 61000-4-2: 2008
IEC 61000-4-3: 2006 + A1: 2007
IEC 61000-4-4: 2004
IEC 61000-4-5: 2005
IEC 61000-4-6: 2007
IEC 61000-4-8: 1993 + A1: 2000
IEC 61000-4-11: 2004
FCC 47 CFR Part 15 Subpart